# Cleveland Innerbelt Strategic Plan

July 2004

DRAFT

# Cleveland Innerbelt Study

*A Strategy for the Intelligent Renewal of the Transportation Infrastructure*

## Strategic Plan

July 2004

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## INTRODUCTION

### 1.1 THE STRATEGIC PLAN DOCUMENT

This chapter will detail the Cleveland Innerbelt Study project history. First, the initial problem statement is presented. Then, the goals and objectives for the study are outlined and a summary of the Existing and Future Conditions Report is presented. Next, a brief summary of the Purpose and Need is included.

Following this background information, a brief overall history of project activities is detailed. This history is meant to give the reader an overall "big picture" view of the process undertaken as part of this study. This summary is divided into the first four steps of the Fourteen-Step ODOT Project Development Process (PDP). These first four steps correspond to the Planning Phase of the PDP.

Once this context has been set, the decision making process utilized by the Scoping Committee is explained. Next, a brief description of all initial alternatives considered as well as a summary of reasons for decisions made is presented. Finally, a list of all relevant study documents is presented, which includes more details regarding the study.

The second chapter of this document outlines the study recommendations, including the Recommended Design Concept and Scope. The third chapter details the Strategic Implementation Plan.

### 1.2 MISSION STATEMENT

One of the first activities undertaken as part of the Cleveland Innerbelt Study was creation of a mission statement for the study. This mission statement was initially developed in a partnering session between all key agencies involved in the study and was later revised and adopted by the Scoping Committee. The final version of that mission statement is:

*We, the Cleveland Innerbelt Study Team, are committed to developing a strategy to provide an effective and efficient transportation system. We will accomplish this through evaluation of alternatives with community partnership, continuous involvement of the public, and addressing neighborhood concerns and input. We will implement responsive and workable solutions, which make Greater Cleveland and the affected neighborhoods superior places to live, work and visit.*

### 1.3 PROBLEM STATEMENT SUMMARY

An initial Problem Statement was developed for the study outlining reasons for conducting the study, identifying the study corridor and identifying problem areas. A summary of this Problem Statement is presented below.

### 1.3.1 Why This Study?

The Ohio Department of Transportation (ODOT) conducted the Cleveland Innerbelt Study (CIS) for the following reasons:

- The existing transportation infrastructure is approaching the end of its useful life and decisions need to be made on what is necessary for rehabilitation and/or replacement
- The operational performance of the Innerbelt is poor, resulting in travel delays, accidents, and undesirable route shifts
- The existing system configuration does not provide efficient traffic movement into and out of the heart of Cleveland.

### 1.3.2 What is the Innerbelt?

The Cleveland Innerbelt is a high capacity, Interstate facility extending from Cleveland's Tremont neighborhood on the west side of the Cuyahoga River, across the valley and around the southern and eastern edges of downtown to the city's lakefront district at Burke Lakefront Airport (Figure 1-1). The study area shown on the following map (Figure 1-2) also indicates the limits of the highways under study. On a daily basis, the Innerbelt serves as a fundamental component of the commuter routes between Cleveland's major employment centers – Downtown, Midtown and University Circle – and the city's neighborhoods and suburbs to the west, southwest, south, and northeast. It also provides access to the interstate highway network for products shipped through the Port of Cleveland and the industrial interests along the lakefront and the Cuyahoga River Valley in the Flats.

The Innerbelt is an important segment of the Federally designated interstate highway system that crisscrosses the United States to provide efficient movement of industrial goods and links major metropolitan centers. The Innerbelt is designated as Interstate 90 (I-90) and serves as the northern terminus for two others, Interstate 71 (I-71) and Interstate 77 (I-77).

- I-90 extends across the northern United States from Seattle, Washington to Boston, Massachusetts through Chicago, Illinois
- I-71 extends southwest and connects Ohio's three major cities – Cleveland, Columbus and Cincinnati – with Louisville, Kentucky
- I-77 stretches to the southeast through Akron and through the Appalachian Mountains to Columbia, South Carolina.

Interstate 80 (I-80), also known as the Ohio Turnpike, extends through the central United States between San Francisco, California and New York, New York. The Innerbelt, I-80, and other linking portions of the interstate network in Cuyahoga County make Cleveland a major crossroads for commerce. The important linking interstates include:

- I-490 south of the Innerbelt links I-90 and I-71 on the west side of the Cuyahoga River through Cleveland's Tremont neighborhood with I-77 on the east side in the area of North Broadway

FIGURE 1-1:

# Cleveland Innerbelt Study Points of Reference

FIGURE 1-2:

# Innerbelt Freeway, Corridor, and Study Area

- I-480 crosses through the southern suburbs of Cuyahoga County north of the Ohio Turnpike (I-80) between North Ridgeville in Lorain County and Streetsboro in Portage County
- I-271 passes through the eastern suburbs of Cuyahoga County from east of Medina on I-71 in Medina County to I-90 in Willoughby Hills in Lake County.

Planned in the 1940s and built during the 1950s and early 1960s, the Innerbelt was designed to move traffic around the south side of downtown rather than through it. It was also intended to complement two existing freeways built in the 1930s – Memorial Shoreway and the Willow Freeway. The Memorial Shoreway extended ten miles along Cleveland's lakefront north of the central business district between Edgewater Park and Gordon Park. The Willow Freeway stretched along the eastside to the community of Independence in southern Cuyahoga County. The Innerbelt was designed to connect to Memorial Shoreway near East 30th Street, join with the Willow Freeway on the south side of downtown and also link to a future freeway across the Cuyahoga River Valley to provide access to Cleveland Hopkins International Airport and points south.

Construction of the 3.24-mile Innerbelt began in December 1954 with groundbreaking for a new eight-lane, high-level bridge south of the Lorain-Carnegie Bridge, which would allow ships to navigate the Cuyahoga River without interruption. At the time of construction, this 5,078-foot long bridge, known as the Central Viaduct, was the widest in the state of Ohio and began carrying traffic in August 1959. The second segment of the Innerbelt, a new depressed roadway passing under the lakefront railroad tracks, opened in December 1959 between Memorial Shoreway and Chester Avenue. The center portion, connecting the Central Viaduct with the highway extension from the Shoreway opened in December 1961, although the last of the 37 access ramps for the Innerbelt was not available to carry traffic until August 1962.

For the past 41 years, traffic has flowed continually on the Innerbelt. Marked increases in traffic volumes have come with the addition of new highway segments and new development in downtown Cleveland and its surrounding neighborhoods. In 1959, 20,000 drivers a day used the Central Viaduct. This volume more than doubled to 42,700 vehicles a day in 1963 after the Innerbelt was complete between the Central Viaduct and Memorial Shoreway.

The first segment of I-90 opened on the Westside from the Central Viaduct to West 41st Street in 1975 causing daily usage of the Innerbelt to increase to 119,500 vehicles per day. By 1990, more than 146,600 vehicles were using the Central Viaduct to cross the Cuyahoga River Valley every day. In 1991, I-490 opened between the I-71/I-90 interchange on the westside of the river and I-77 on the east through the Tremont neighborhood and diverted a portion of traffic from the Innerbelt. However, the Central Viaduct continued to carry 134,700 vehicles daily in 1991.

The decrease in traffic on the Innerbelt following the opening of I-490 was short lived. Throughout the 1990s, a significant amount of new development occurred in downtown Cleveland and its surrounding neighborhoods. By 2000, an estimated 145,000 to 150,000

vehicles were using the Innerbelt each day, causing drivers to experience routine traffic congestion and longer travel times.

The Innerbelt and its supporting highways have served as a key component to the region's growth, specifically in downtown Cleveland. However, the period since the Innerbelt was planned and built has also seen the suburbanization of the U.S., the explosion of truck-borne commerce, changes to industrial processes affecting the steel-making industry and its allied businesses, and other social-economic-environmental changes. Also occurring during this time was the aging of the physical condition of the highways. A number of the interstate highways in the state are in the process of or will soon be in need of a complete overhaul. This study strives to address all the relevant factors involved in making well-informed decisions that will spell out the future course of transportation in the area and, particularly, the Innerbelt.

The CIS study area includes numerous other transportation-related facilities, which make this area critical for the provision of multi-modal connections.

- Burke Lakefront Airport
- Greater Cleveland Regional Transit Authority (GCRTA) rail and bus operations and facilities
- Port of Cleveland facilities north of the Shoreway
- Major facilities of the Norfolk Southern and CSX Railroads including the Collinwood Yards Intermodal Hub
- Amtrak facilities
- Major arterial streets (e.g., E. 9th, Superior)
- Other major generators of freight traffic (e.g. the Flats area).

There are also several concurrent and/or recent studies that were to be taken into account:

- Civic Vision 2000
- Cleveland-Akron-Canton Corridor Study
- Flats Area Transportation Study
- Waterfront Line Extension Major Investment Study
- Euclid Avenue Corridor Study
- Bessemer Avenue Extension
- Lakefront Transportation Center Plan
- Planning for the Towpath Trail
- Cleveland-Cuyahoga County Port Authority Maritime Facilities Master Plan
- Lakefront and Cuyahoga Valley planning efforts
- National Heritage Corridor Management Plan.

In addition to the above, there are various neighborhood issues (for example, cut-through traffic on West 14th during periods of high congestion) associated with the Innerbelt. This study sought to focus on how to leverage the future investments needed to improve the

transportation system deficiencies so that opportunities to enhance local and regional economic development potential and the neighborhoods' quality of life are realized.

### 1.3.3 Transportation Infrastructure Issues

In order to define the existing (and where appropriate, the foreseeable) problems, the issues have been grouped into three major factors:

- Status of the aging infrastructure
- Operational deficiencies (capacity, accidents, etc.)
- Functionality/system configuration of the highways.

#### 1.3.3.1 Infrastructure Condition

The information contained in this section is taken from:

- The Central Viaduct: I-90 Corridor Report, 1999
- ODOT Bridge Condition Report, December 28, 2000
- ODOT Pavement Condition Report, April 10 to November 2, 2000.

***South Innerbelt Section (I-71 from West 25th Street to I-90 and I-90 from I-71/490 to the Central Viaduct Bridge)***
Including the following connectors:

- I-77 from I-490
- I-90 from West 25th Street (USR-42)
- I-490 from I-71/I-90 to East 55th Street
- Jennings Freeway (SR 176) from Denison Avenue.

***Pavements (I-71, I-90)***
This 1.4-mile section of I-71 concrete pavement was built in the late 1960's and subsequently covered with asphalt overlays that are currently in good condition with only slight joint distress that does not appreciably affect the rideability. Pavement markings are also in good condition.

I-90 from the I-71/490 interchange to the Central Viaduct bridge, approximately 0.6 miles long, was built in the 1960's. The original concrete pavement has been overlain with asphalt, which is currently in good riding condition with visible pavement markings.

Some of the older asphalt overlays on the interchange ramps exhibit distress in the form of potholes and joint faulting.

***Bridges (I-71, I-90 and Connectors)***
There are approximately 34 bridges within the limits of the south section of the Innerbelt and its connectors. All these bridges are over 30 years old (except for the I-490 bridges between I-71 and I-77) and have their original decks.

The mainline and overhead decks have been overlaid and patched numerous times and are approaching the ends of their useful service lives. The wearing surfaces of the mainline bridges in the area of the I-71/90/490 interchange will become more difficult to maintain over the next few years unless significant intervention occurs. Replacement of the mainline decks at their existing widths would require closing traffic down to two lanes in many cases and down to one lane in some cases on the two-lane ramp bridges in the interchanges. The I-90 eastbound ramp bridge through the I-71/490 interchange is currently only two lanes wide and backs up traffic in the peak hours without any construction activities present.

Widening bridges in this corridor will be difficult at best. Widening of mainline and ramp bridges within interchanges is further complicated by the proximity of piers supporting the upper levels of the interchange. The existing horizontal and vertical clearances between pier caps and roadways below are often minimal.

Most of the bridges in the three interchanges located in the south Innerbelt section contain fracture-critical members and fatigue-prone structural steel details. Some of the fatigue-prone details have been retrofitted in prior projects; however, other fatigue-prone details have not been retrofitted because there is no practical way to accomplish the work.

***I-77 (I-490 to I-90)***

This 1.6-mile section of road was originally built from 1960 to 1964. The asphalt overlay on the concrete pavement and pavement markings are in good condition. A few small potholes have appeared, but the joint distress is minor. The new Kingsbury Run Bridge was completely open to traffic in the fall of 2000. The concrete wearing surface of the I-77 bridge over I-490 has potholes, is heavily patched, and will require significant intervention soon to maintain acceptable rideability. Replacement of this deck at existing width would require closing I-77 to one lane in each direction for at least one phase of work. The concrete bridge wearing surfaces north of Kingsbury Run are in better condition, but still have many patches and visible potholes.

***I-90 (W. 25$^{th}$ St. to I-71)***

This half-mile section of asphalt on concrete pavement exhibits some potholes, longitudinal and transverse joint distress and delaminations, but still has acceptable rideability with no pothole-avoidance driver behavior observed. The original asphalt overlays on the bridge decks have been replaced with concrete, which are in good condition.

***I-490 (I-71 to E. 55$^{th}$ St.)***

The I-490 interchanges with I-71/90 and I-77 was built when those routes were constructed in the mid-1960's. The concrete pavement was continued east from I-77 to East 55th Street, which is still the eastern terminus of I-490. Portions of these original concrete pavements are deficient while others are in good condition. A portion of the concrete pavement between I-77 and East 55th Street exhibits much distress. The quarter-mile immediately adjacent to east 55th Street is in excellent condition.

The portion of I-490 including the West 7th Street and Broadway Avenue (SR-14) interchanges as well as the Cuyahoga River bridge was built in the late 1980's and is in good condition.

The West 7th Street, Broadway Avenue, and Cuyahoga River bridges are in good condition. The damaged areas in the concrete overlay on the Cuyahoga River Bridge have been removed and replaced with new concrete.

The overhead NS railroad bridge between I-77 and East 55th Street, which was built in 1964, remains in limited service with many of its tracks removed.

***Jennings Freeway (SR-176)***

The three-quarter mile section of SR 176 and the Jennings Road, Denison Road, and the I-71 interchanges were built from 1965 through 1978. The asphalt overlay on this concrete pavement has potholes, cracks, joint distress, and is rough riding. The asphalt overlay on the Denison Bridge was recently replaced with concrete that should serve well for 10 or more years.

The I-71 northbound and the Jennings Freeway northbound superstructures share the same substructures in this two level bridge, which is approximately 1/3-mile long. Alteration to the geometry on these bridges would require special consideration. Both decks have been repaired with concrete overlays; the upper overlay has been patched for the last few years because of its age. The fatigue-prone details in the steel box girder pier cap have been retrofitted. No retrofits have been performed on the steel I-girder pier caps.

***Central Viaduct Bridge***

This 5,078-foot long structure was put into service in 1959 and has been in continuous use throughout its 45-year history. The truss portion of the central viaduct occupies approximately 2,721 feet of the total length of the bridge. The 1,204-foot long west approach structure consists of 14 continuous multi-beam spans. The 1,153-foot long east approach consists of ten continuous multi-beam spans.

Three quarters of the east approach deck has been replaced. The remaining one-quarter of the original deck is located on the outside lanes of the eastbound direction. This portion was delayed to accommodate traffic diverted to I-90 by the closing of ramps in the I-77 Kingsbury Run bridge rehabilitation project. The portion of the east approach deck that was not replaced is in worse condition than any other original portion of the Central Viaduct bridge decks. The built-up girders in the east approach mainline and ramp structures contain fatigue cracks, many of which were retrofitted where the deck was replaced.

The rolled beams that comprise most of the west approach structure are in good shape. The wearing surface has a remaining useful life of less than ten years. This deck could possibly tolerate another concrete overlay to extend its life another 10 or 15 years.

The deck on the truss portion of the Central Viaduct Bridge is in the best condition of the three segments. This deck was found to be in good condition when the existing asphalt

overlay was removed and a latex modified concrete overlay placed in 1984. This project also eliminated the asphalt subdrains, which, up to that point, had been depositing deicing chemicals onto the steel truss superstructure below for a period of about 25 years. The steel truss components have been damaged by the drainage runoff from the deck over their entire life and this damage continues today, albeit to a lesser extent.

Determination of the long term disposition of the truss portion of the Central Viaduct bridge includes an in-depth inspection to determine the amount of corrosion loss at critical sections, a fatigue analysis to determine the remaining fatigue life of the structure, and an updated load capacity analysis to determine how many members require strengthening. Replacement of the deck on the Central Viaduct truss could be accomplished in stages to facilitate maintenance of traffic. However, the entire replacement of the truss portion of the bridge could not be accomplished in stages without extensive shoring because there are only two trusses supporting the floor system and deck. Furthermore, significant widening of the Central Viaduct Bridge without additional substructures would not be feasible because the cantilever extensions of the deck outside the trusses would become excessive.

***The North Innerbelt Section (I-90 from the Central Viaduct Bridge to the Shoreway)***

***Pavement***

This one and three-quarter-mile long section includes the Central interchange with I-77, the tunnel-like portion under the city streets, and the interchange with the East Memorial Shoreway (SR-2) at the Innerbelt curve. The original concrete pavement and bridges were built between 1958 and 1963.

The asphalt overlay on the concrete pavement is in good condition, but has some joint distress including cracks, delaminations, and some faulting; however, the surface is smooth and the pavement markings are readily visible. The section just south of the Shoreway is in worse shape due to potholes.

***Bridges***

Approximately twenty-three bridges were built within the limits of this section of the corridor. Three of the sixteen overhead bridges have been redecked in the last 10 years and the other original asphalt wearing surfaces were replaced with concrete overlays.

The mainline and the other overhead bridge decks are at least 35 years old. The wearing surfaces of the mainline bridges in the area of the 1-77 interchange have recently been repaired with hydro-demolition and micro-silica concrete overlays that should last at least 10 years. Replacement of these decks at their existing widths would require closing I-90 down to two lanes at best.

Most of the tracks have been removed from the large CSX Railroad bridge south of Lakeside Avenue. The presence of the railroads (CSX and N-S) and the Burke Lakefront Airport were part of constraints that produced the original construction of the Innerbelt curve in the 1950s. Relocation of the curve could be less problematic without having to deal with numerous sets of railroad tracks.

The overhead bridges with walled abutments will be an impediment to the widening of the Innerbelt pavement.

### 1.3.3.2 Operational Issues

I-90 through downtown Cleveland is the heaviest traveled route of all the highways under the jurisdiction of the Ohio Department of Transportation's (ODOT) District 12. Since 1990, there have been several studies that have looked at the freeway system in Cuyahoga County to evaluate the performance of the system in terms of how it handles the travel demands placed upon it. In addition to several accident studies done in the early '90's, and available recent (1998) data, the following studies have helped form the basis for the definition of the various problems to be addressed in the CIS:

- The Cleveland Memorial Shoreway Study, March 1995
- Freeway System Bottleneck Study, September 1996
- Freeway Travel Time Study, May 1997
- High Occupancy Vehicle Study-Concept Analysis, October 1999
- The Central Viaduct: I-90 Corridor Report, 1999.

These studies have evaluated portions of the CIS study area and for the most part, rely on 1990 traffic data augmented with some additional updated data.

The demands placed upon the corridor over time have also been impacted by changing development patterns and the resulting change in travel patterns. Since the Innerbelt opened in the 1960s, significant changes in development have occurred in downtown Cleveland and its surrounding neighborhoods, which were not anticipated in the original planning.

In 1967, Cleveland State University was founded and currently approximately 15,000 students attend Cleveland State's downtown commuter-oriented campus. This campus is centered on Euclid Avenue between Playhouse Square and the Innerbelt. Also, during the 1960s and 1970s, the Metro campus of Cuyahoga Community College was constructed south of the Innerbelt between East 22nd and East 30th Streets.

In the 1960s, Cleveland's downtown office and retail core began a transition in development away from Public Square and Euclid Avenue and toward East 9th Street that continued through the 1970s and into the 1980s. Further, two new government facilities – the Frank Lausche State Office Building and the Justice Center – consolidated government workers on the west side of downtown.

During the late 1980s, developer attention refocused to Public Square with the opening of new office, retail, and hotel developments. In the Warehouse District, older commercial buildings were being transformed with ground level retail development and residential units and offices on the upper floors. Finally, several new sports facilities were constructed.

The following discussion about how the CIS system operates is based on available information at the outset of the study. The CIS study area has been broken into six segments to point out some of the critical factors.

A couple of the key factors that transportation planners and engineers use in their work are measures that relate to the traffic flow and capacity of a given section of roadway and the accident rate of a segment. The first item is described as the Level of Service (LOS) (Figure 1-3) and is expressed in a scale from A (best) to F (worst), much as grades for school. LOS F is characterized by stop-and-go traffic, slower speeds, increased accident exposure, etc. Since there are so many variables that can come into play in accidents and in order to give professionals a "yardstick" by which to measure and compare, the accident rate takes into account the number of accidents, segment length, and traffic volumes. The rate is then expressed in "accidents per million vehicle-miles of travel" (MVMT). As a guide, the statewide average for urban Interstate highways is approximately 1.25 accidents per MVMT.

***Segment One (The Metrohealth Curve)***

- I-71 reduces from 4 lanes to 2 lanes as it curves north to merge with the Jennings Freeway which forms the first of the "bottlenecks"
- Speeds decrease substantially from approximately 60 mph to 20 mph
- In the morning peak, as traffic breaks down, vehicles exit the freeway to W. 14th making a cut-through in the Tremont neighborhood re-entering the freeway at Fairfield Avenue
- The morning peak has a LOS E/F in the northbound direction
- During the afternoon peak the southbound lanes operate at LOS E
- The accident rate in this area is 2.31 accidents per MVMT.

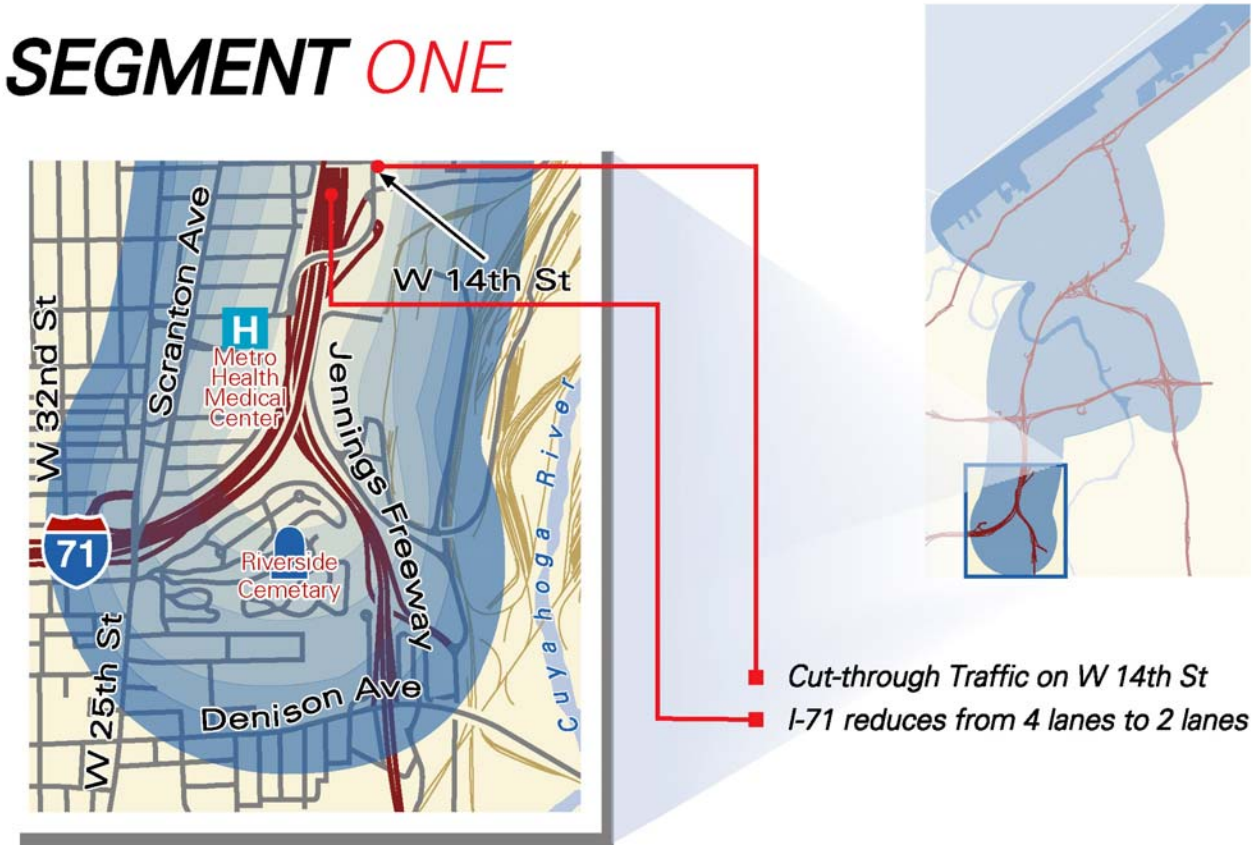


FIGURE 1-3:

# Level of Service

Level of Service A

Level of Service B

Level of Service C

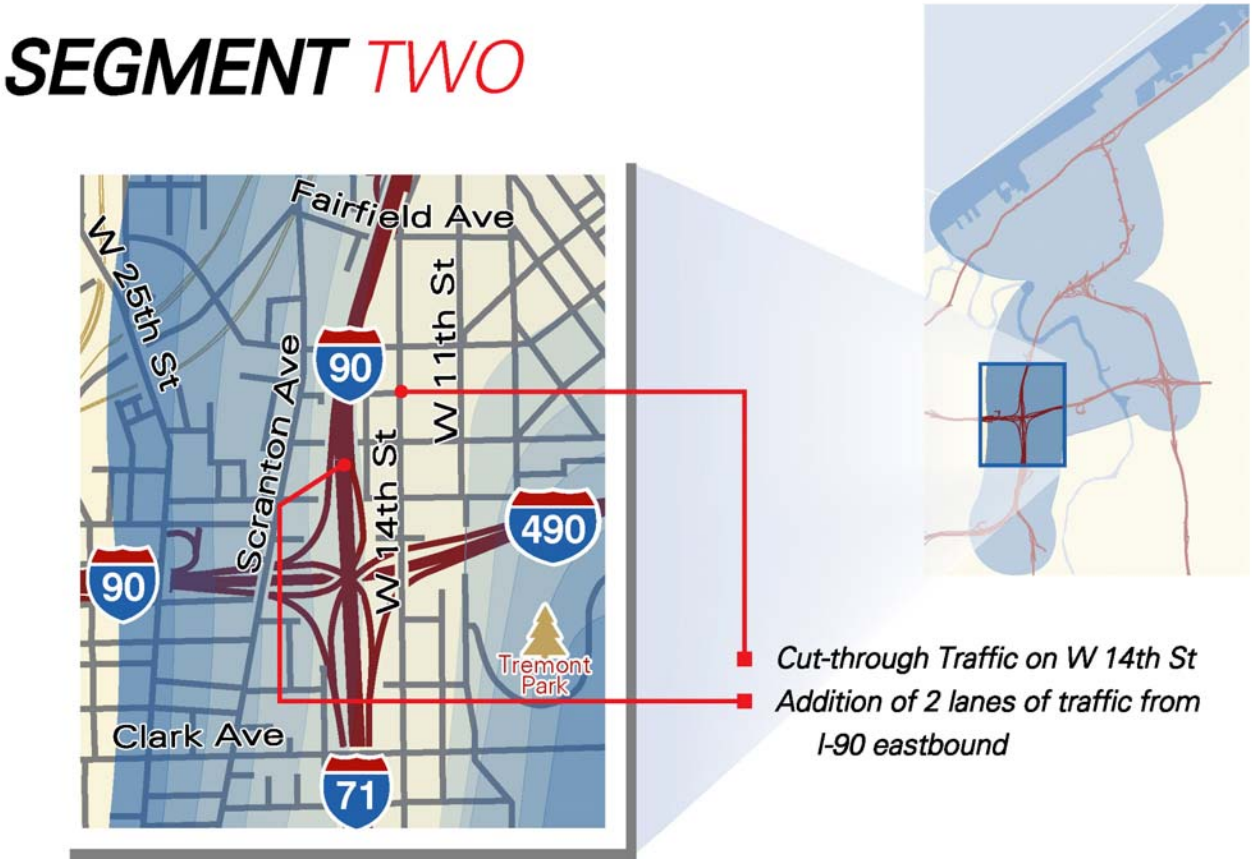
Level of Service D

Level of Service E

Level of Service F

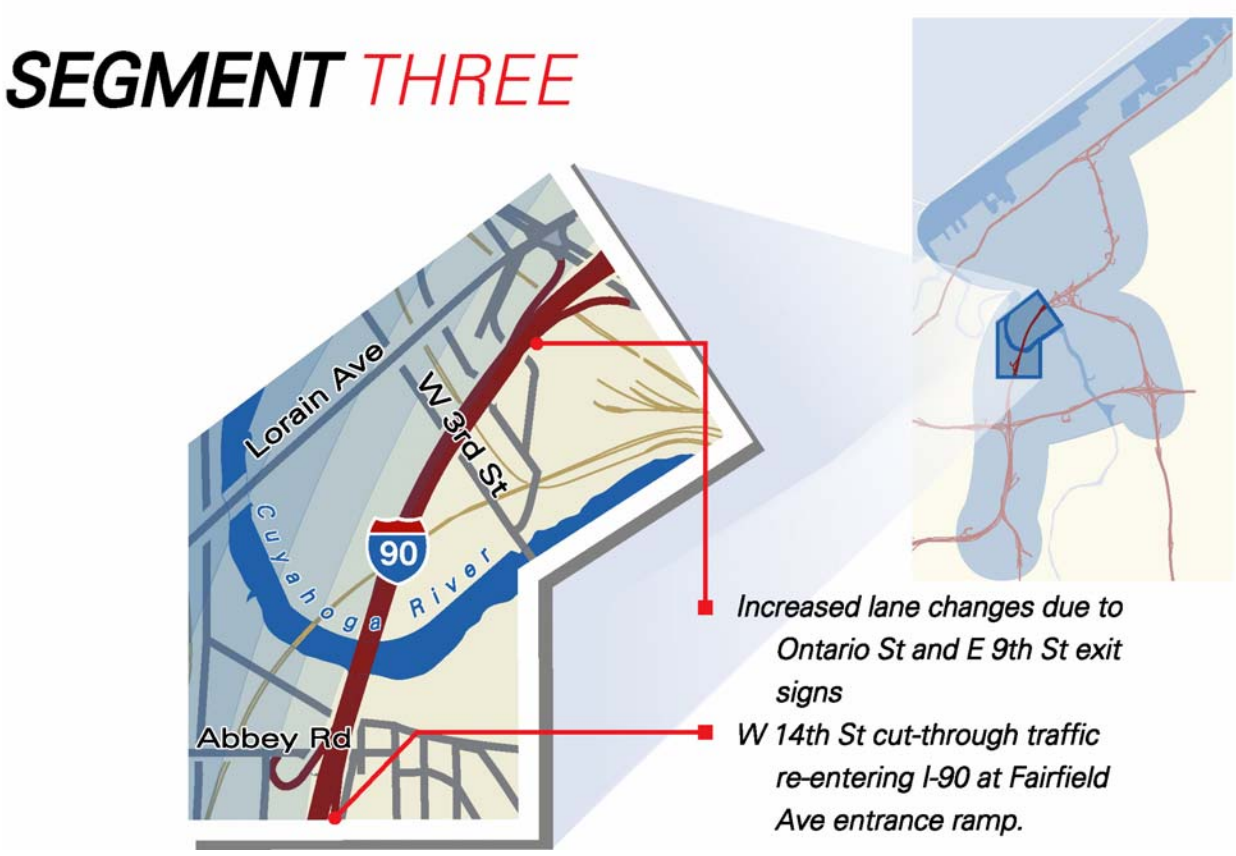
***Segment Two (I-71/90/490 Interchange)***

- In the morning peak, congestion due to the I-71/Jennings merge is further compounded with the addition of traffic from 2 lanes of the I-90 eastbound ramp
- Northbound speeds average 30 mph and traffic encounters stop and go operations
- I-71 northbound, prior to the I-90 merge, operates at LOS F in the morning peak
- I-90 westbound operates at LOS E during the evening rush hour
- The accident rate on I-90 west of the interchange is 1.92 accidents per MVMT
- The I-71 accident rate is 3.07 accidents per MVMT.



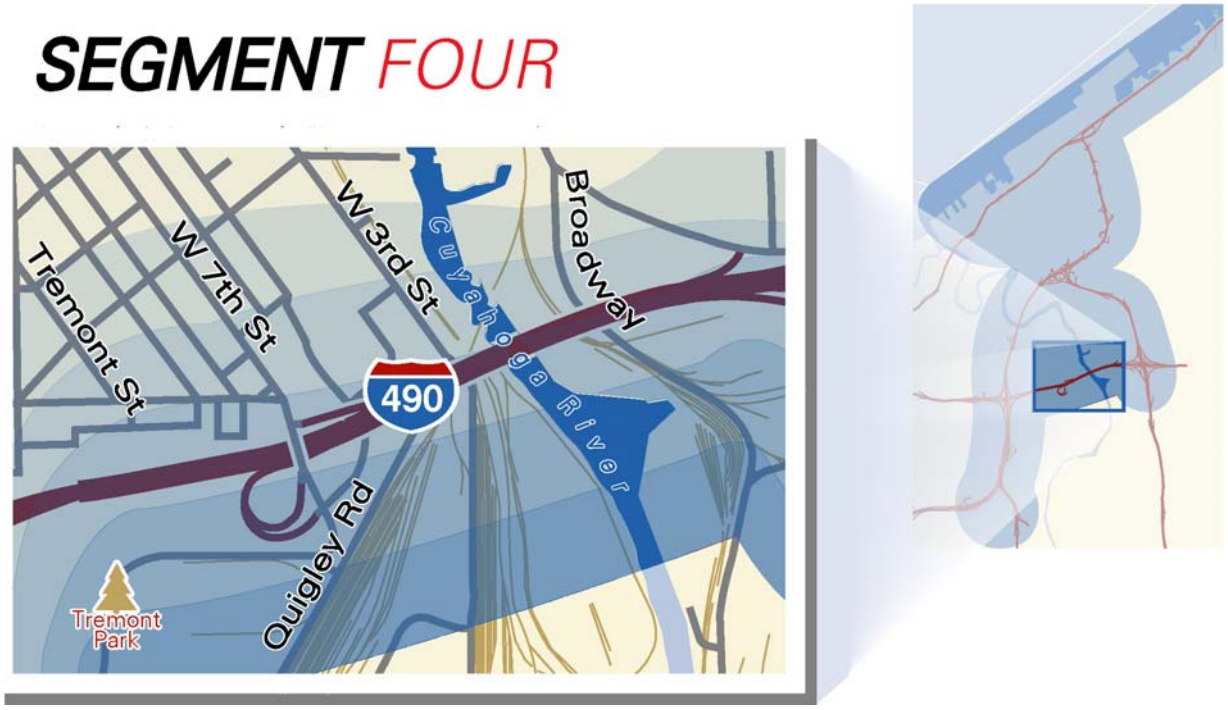
***Segment Three (Central Viaduct I-90)***

- This section operates at a LOS F eastbound in the morning and LOS D westbound in the evening
- Operating speeds average 34 mph in the morning eastbound and 42 mph westbound in the afternoon peak
- The entrance ramp from W. 14th at Fairfield Ave. returns the cut through traffic that left the freeway to "beat" the congestion
- As traffic nears the downtown the right two lanes are signed for the exits at Ontario and E. 9th and traffic experiences increased lane changes further breaking down the operation
- This segment has an accident rate of 2.12 accidents/MVMT.



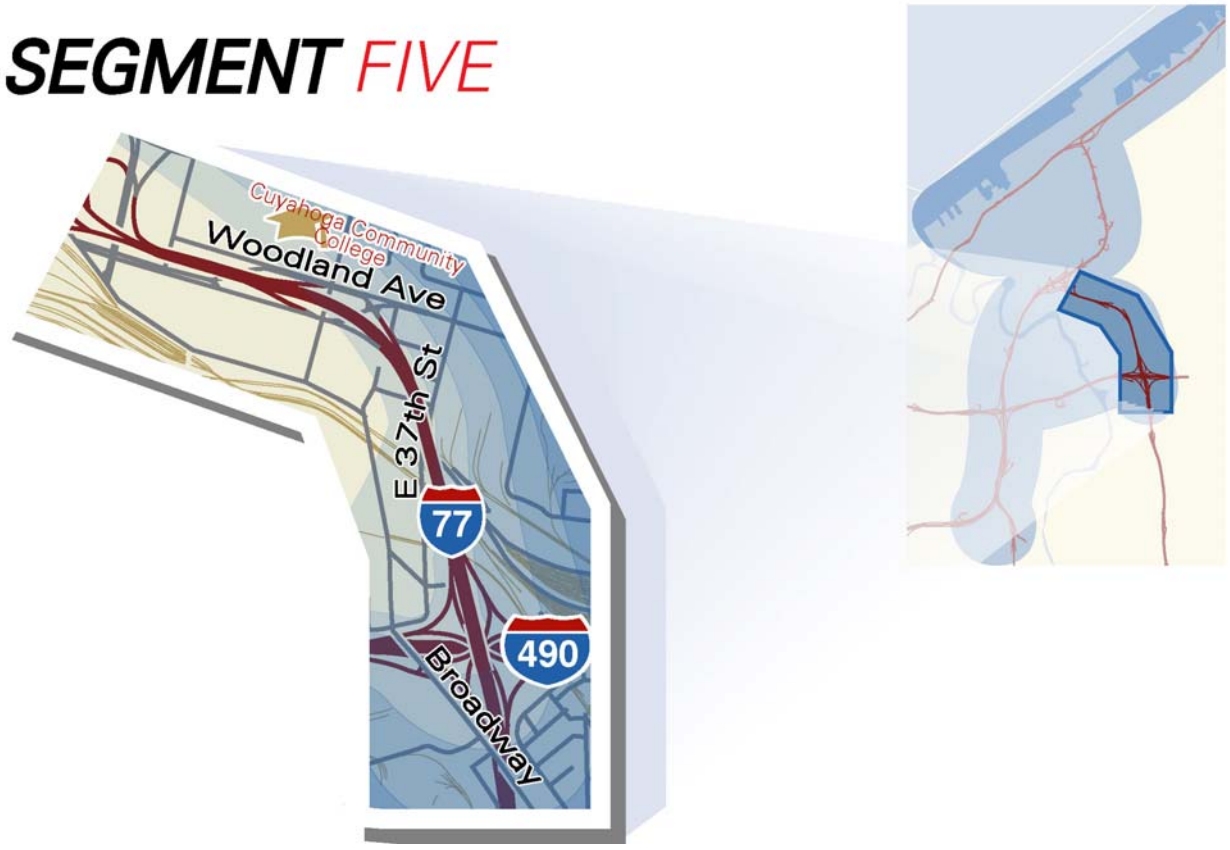
***Segment Four (I-490)***

- The accident rate between I-90 and I-77 is 1.81 accidents/MVMT
- There is a high accident rate (8.11/MVMT) in the segment from I-77 to E. 55th Street
- The morning and afternoon peak in both directions operate at LOS C.



***Segment Five (I-77)***

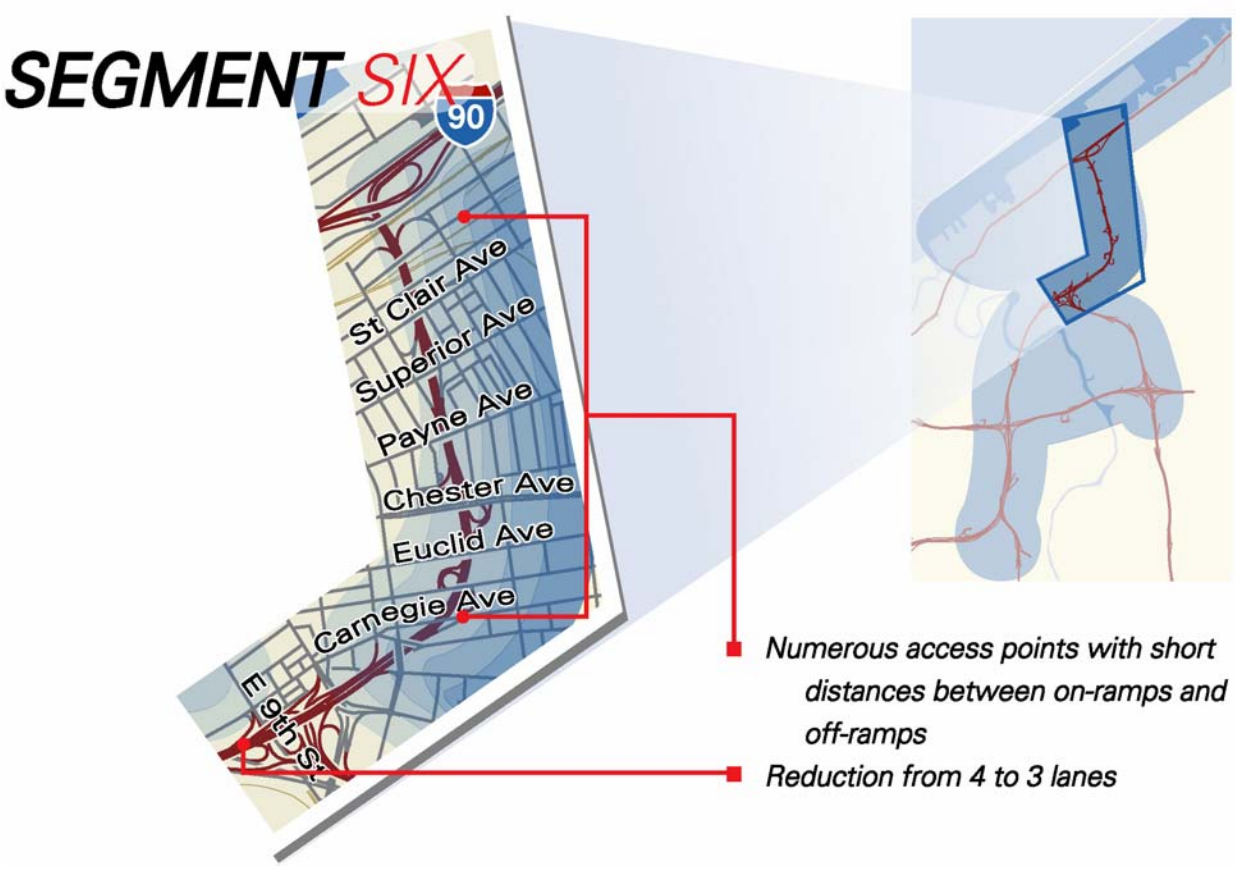
- The northbound lanes in the morning peak (both north and south of the I-490 interchange) operates at LOS E
- At the ramps at Woodland Ave. the northbound morning peak is at LOS E while the evening peak southbound operates at LOS C
- The southbound afternoon peak north of I-490 is LOS D and south of the interchange operates at LOS E/F
- The accident rate for this segment is 4.55 accidents per MVMT.




***Segment Six (I-90 From E. 9th To Shoreway)***

- Reduces from 4 to 3 lanes between Ontario and E. 9th Street
- Congestion from ramps entering local street system backs traffic into the freeway
- The central interchange of I-90 with I-77 and downtown street system through E. 22nd causes confusion
- High accident rate in junction (E. 9th to E. 22nd) is very high at 4.07 accidents/MVMT
- Whole segment (E. 9th to East Shoreway) has a rate of 2.76 accidents/MVMT
- Constrained section with numerous access points with short weave sections between on- and off-ramps
- The westbound afternoon peak experiences average speeds from 27 mph to 38 mph between Lakeside and Carnegie with a resultant LOS D

- The Innerbelt curve operates at LOS E and F in the westbound direction in the morning rush (with a LOS D in the afternoon) and at LOS D eastbound in the afternoon
- The curve has a design speed of approximately 30 mph, which greatly affects LOS.




### 1.3.3.3 Functionality/System Configuration

As one travels the Cleveland Innerbelt (I-90) and its major "tributaries" (i.e., I-71, I-490, I-77, Jennings Freeway, Memorial Shoreway, the local street systems of the Downtown and its near-by neighbors) one can see and experience the highway planning, design and construction decisions made over the latter half of the 20th century. To fully understand the context of the Innerbelt, it is important to note the original intent and purposes of the freeway system, as well as determining how well that system meets the needs of the region in the 21st century.

While this approach maximized access points along the Innerbelt, it did so at the expense of today's need for operational efficiency, safety, and consistency. The large number of access points in this relatively short segment of freeway results in short "weave" sections, which are sections where traffic entering the freeway conflicts with traffic attempting to exit the freeway. These conflicts result in degraded operation of the freeway and, in peak periods, increased risk for traffic crashes.

Further, there is no consistent interchange type used along the Innerbelt. This inconsistency, combined with poor way-finding (signage), results in significant driver confusion both accessing and exiting the freeway. While much of the traffic exiting the Innerbelt has a destination in the city center, many of the exits along the eastbound portion of the Innerbelt leave drivers facing the opposite direction of downtown. This can be disorienting for drivers not familiar with the area. Further, access to interchanges is not standardized. In some instances, on-ramps are accessed from side streets, which is counter-intuitive and causes confusion.

The design of most of Innerbelt freeway segments and interchanges predates the existence of modern freeway and interchange design standards. Many of the Innerbelt interchanges do not meet current design standards. Some examples of Innerbelt elements that do not meet modern standards are:

- The radius of the Innerbelt curve is too tight
- The radius of the eastbound Ontario off-ramp in the Central Interchange area is too tight
- The radius of the eastbound E. 9th Street off-ramp in the Central Interchange area is too tight
- There is inadequate storage lengths provided for both the eastbound Ontario off-ramp and the E. 9th Street off-ramp
- There is inadequate sight distance and acceleration length for the eastbound St. Clair on-ramp
- The radius of the eastbound Innerbelt to Shoreway ramp is too tight.

Also, most of this 2-mile segment has three through lanes in each direction but this section also has four lanes leading into it in both directions, which further adds to the congestion problems.

In addition to the above, the Innerbelt is also affected by the street system, which receives and distributes the traffic in the downtown. The local street system is often the weakest link in the local transportation system in that it can be a constraining factor of how well the higher-level of highways performs its function of carrying traffic. This type of impact can be seen at the I-90 eastbound off-ramp feeding into E. 9th Street which has traffic signals at major intersections in close proximity to the ramp terminal, resulting in increased traffic congestion in that area.

## 1.4 GOALS AND OBJECTIVES

Once the mission statement and problem statement were completed, work began with the Scoping Committee to develop a set of goals and objectives for the study. They helped to establish the context within which data collection and alternative development was conducted. The final version of the goals and objectives adopted by the Scoping Committee is presented below.

***Goal I – Accessibility***

Providing access to destinations is a basic objective of a transportation system. This goal measures the *ability* of a user to access jobs, services, goods or other parts of the transportation system. This goal is usually viewed from the user's perspective. It poses questions such as: Can I get to where I want to go? Is it direct? Is it the shortest route? It also addresses the issue of service provision (e.g., transit availability?) or service availability (e.g., adequate parking at the end of the trip).

Objectives

1. Improve access to industrial and employment areas without routing traffic through neighborhoods
2. Improve access to downtown and tourist venues
3. Improve public access to the waterfront and parks
4. Improve access into/out of neighborhoods
5. Improve access through downtown

***Goal II – Mobility***

Mobility measures the relative *ease or difficulty* of the trip that a user is able to make. This goal usually encompasses congestion, trip characteristics (time, length), and availability of other means of travel (e.g., bus transit). Congestion is an example of a condition that delays a trip that otherwise has outstanding access. Mobility also addresses service levels, for example frequency of bus/rail service.

Objectives

1. Reduce use of local streets as freeway bypasses
2. Improve through traffic on Innerbelt
3. Improve public transit opportunities within the Corridor during and after construction
4. Improve peak hour Level Of Service on freeways with a preference given to solutions which improve traffic on neighborhood streets as a priority over downtown intersections
5. Provide pedestrian/bicycle facilities where feasible
6. Reduce local neighborhood traffic volumes

***Goal III – Economic and Community Development***

While access and mobility are basic objectives of the transportation system, economic development is an essential reason for providing those services. This goal examines accessibility and mobility for the purpose of improving a region's competitive advantage. Competitive advantage is typically expressed in terms that encompass costs, labor availability, and development opportunities. It will examine specific locations (e.g., employment centers, development sites) and service levels (e.g., travel time, delays) and support facilities (e.g., truck routes).

Objectives

1. Improve access to identified development opportunities
2. Enhance freight/goods movement within and through the Corridor
3. Coordinate with and, where the opportunity arises, assist community and economic development plans and projects to support self-sufficient neighborhoods
4. Improve access to major employment centers
5. Enhance the aesthetics of the corridor to help achieve economic development goals and encourage urban development opportunities

***Goal IV – Quality of Life***

The quality of life can relate to nearly all of the goal categories. Here, the quality of life attributes (which are difficult to measure or compare) relate to the enjoyment of one's location. Included are concerns with aesthetics, air and noise impacts and land use changes.

Objectives

1. Achieve high quality aesthetic design for transportation facilities within the Corridor and designs that are unique to the region
2. Improve the neighborhood/transportation facility edges (boundaries)
3. No residential or institutional property takes. Commercial displacements only with local relocation
4. Address air, noise, vibration, and lighting impacts
5. Integrate the use of public art in design of improvements associated with the Innerbelt
6. Identify and address quality of life impacts of past projects, and original Innerbelt construction
7. Reduce truck traffic in neighborhoods

***Goal V – Environment***

Environmental impacts are often considered as a consequence of the construction of transportation facilities. This goal considers resource usage from fuel consumption to land uses. It also considers impacts to valued community resources such as residential areas, historic structures and districts, parks, or special population groups. While this goal category may have limited performance measures, it is extensively supplemented by the environmental impact evaluations conducted as part of the environmental studies for specific projects.

Objectives

1. Preserve, protect, and expand parks and open space throughout the corridor (lakefront, the river, and within the neighborhoods)
2. Adhere to Executive Order 12898 on Environmental Justice
3. Protect historic resources
4. Provide for business relocation within the study area

5. Protect and enhance the natural environment
6. Improve and enhance lighting
7. Include environmental considerations within the life-cycle cost analysis

***Goal VI – Safety***

The level of safety is also considered as a consequence of transportation investments. Basic safety concerns are the avoidance of harm to body or property as usually measured by accident frequency, intensity or cost. Safety concerns can also relate to modal type, incident management, and emergency response time.

Objectives

1. Reduce accident rates and severity
2. Reduce truck/car conflict
3. Assure the safety of pedestrians, bicyclists, and other non-motorized forms of transportation impacted by the project
4. Improve lighting to make areas safer in and around the Innerbelt Corridor
5. Add or improve signage as needed within/around the Innerbelt Corridor for directional guidance
6. Consider enhanced security in designing the facilities (e.g., underpasses)
7. Provide for safety of police and EMS vehicles on the Innerbelt

***Goal VII – Operational Efficiency***

This goal relates to the effectiveness of the transportation facilities. Operational efficiency relates to design and management issues that often are of concern to the service supplier. This includes conformance to minimal design standards, traffic management, maintenance practices, and costs.

Objectives

1. Maximize efficiency of interchanges and impacted intersections
2. Improve monitoring and management of traffic flow to maximize the efficiency of existing facilities
3. Integrate freeway and arterial operations for ease of use and compatibility with neighborhoods
4. Design facilities to meet or exceed design standards
5. Integrate requirements for maintenance into the design of new transportation facilities
6. Maximize vehicle occupancy

***Goal VIII – Cost Effectiveness***

Cost effectiveness measures the ability to: (1) maximize user and community benefits given the infrastructure costs; and (2) the ability to finance the whole range of proposed improvements, not just those with Federal funds. This includes maximizing the number sources, creative use of traditional non-transportation sources (i.e., other public funds),

maximizing the use of non-local dollars and the coordination of requests at the state and federal level.

Objectives

1. Maximize returns/benefits for capital and operating costs
2. Leverage federal, state and local funds to meet capital needs
3. Maximize opportunities for private investment
4. Coordinate with other transportation studies underway and planned infrastructure improvements
5. Use creative financial planning/funding options
6. Use life-cycle costing to fully account for long-term maintenance and future replacement costs
7. Include funding for rehabilitation and improvement of Innerbelt-impacted neighborhoods/routes after construction that are consistent with neighborhood plans

***Goal IX – Constructability***

This goal relates to the ability to minimize disruption during construction with rational phasing and sequencing of projects. This would include disruption of transportation services (e.g., facility closures) as well as community impacts (e.g., business closures) in the short term. Constructability may cover a five to ten year period for the Innerbelt study.

Objectives

1. Minimize community and business disruption
2. Assure cost-effective implementation during construction sequencing
3. Maintain access and current levels of service during construction
4. Provide for safe and adequate alternate routes and modes of transportation
5. Develop clear criteria for the selection of alternative routes

***Goal X: Physical Condition***

This goal relates to renewal of the physical condition of the bridge decks and roadway pavements on the Innerbelt.

Objective

1. Replace the bridge decks and rehabilitate the roadway pavements of the Innerbelt Freeway as required to renew their physical condition in support of the other goals and objectives of the Cleveland Innerbelt project.

## 1.5 EXISTING AND FUTURE CONDITIONS REPORT SUMMARY

### 1.5.1 Introduction

The Cleveland Innerbelt Study identified and evaluated a wide range of multi-modal solutions to address the problems of the Innerbelt. The *Existing and Future Conditions Report* documents the conditions and problems of the Innerbelt and the socioeconomic and environmental baselines in the corridor. Understanding the conditions, problems, and environmental context of the Innerbelt also served as a basis for identifying and formulating alternative solutions to those problems.

### 1.5.2 Project Study Boundaries

There are a number of geographic areas that are referred to: (1) the Innerbelt, (2) the Innerbelt Corridor, (3) the Innerbelt study area, and (4) the travel demand area. Each geographic area encompasses a larger area than the previous one and is explained below. Figure 1-2 illustrates these areas except for the travel demand area, which encompasses a five-county region.

***The Innerbelt*** – The Innerbelt refers to the actual interstate roadway that is the central focus of the study. The Innerbelt begins at I-71 and West 25$^{th}$ Street and proceeds north along I-71 past the merge with State Route 176 (Jennings Freeway) to the I-71/I-90/I-490 interchange. From this interchange the Innerbelt proceeds north along I-90, over the Central Viaduct Bridge, which carries the traffic over the Cuyahoga River. On the east bank of the Cuyahoga River, I-90 interchanges with I-77 at a location know as the Central Interchange. From the Central Interchange, the Innerbelt (I-90) continues north along the eastern edge of downtown Cleveland in a depressed section of freeway, through the Innerbelt Curve to where it merges with State Route 2 (The Shoreway). At the end of the Innerbelt, I-90 continues to the east through Cleveland and on to Lake County. The Innerbelt includes all of the freeway ramp connections with the local street system as well as connections with other interstates and State Routes.

***The Innerbelt Corridor*** – The Innerbelt Corridor refers to the Innerbelt freeway facilities, as well as the freeway and surface street network that feeds the Innerbelt. Thus, the Innerbelt Corridor Area also includes the downtown Cleveland central business district (CBD). The CBD is bordered by the trenched section of I-90 on the east, the eastern bank of the Cuyahoga River on the west, Lake Erie on the north, and the I-90/I-77 interchange and Central Viaduct Bridge on the south. The corridor also includes:

- The entirety of I-490
- The I-490/I-77 interchange
- The I-90/I-71/I-490 interchange
- A segment of I-90 from West 25$^{th}$ Street to I-71
- A segment of the Jennings Freeway from Harvard Road to I-71
- The area bounded by I-90, I-490, and I-77.

***The Innerbelt Study Area*** – Changes in traffic within the Innerbelt Corridor can create impacts that are also felt in the neighborhoods within and surrounding the corridor. At the initiation of the study, a study area boundary was defined which generally went from Lake Erie southward to Harvard Avenue and from about West 45th Street eastward to about East 57th Street. The study area also includes a portion of I-90 out to West 72nd Street. The study area represents the areas where environmental, socioeconomic, and historical resource information was collected, in addition to transportation data.

***Travel Demand Area*** – One of the key analysis tools of the study is the regional travel demand model of the Northeast Ohio Areawide Coordinating Agency (NOACA). The model forecasts travel demand over the five-county NOACA region that includes Cuyahoga, Geauga, Lake, Medina, and Lorain. It represents the primary tool for conducting the travel and traffic portion of this study. It is calibrated to the observed travel behavior of the region and validated against highway and transit counts. Its purpose is to forecast the regional and corridor-level transportation impacts of various alternatives, including highway, bus, and rail modes.

### 1.5.3 Study Overview

As the Greater Cleveland area grows and expands, it is important to understand the history of the study corridor and the findings of previous studies in and around the study area. This proactive approach ensures that the ideas put forth as part of this study will complement plans that may already be in existence. Therefore, a literature search was conducted of all relevant studies, ranging from technical studies of the freeway system to master plans for future expansions. Studies reviewed include the following type and number of reports:

- Historical studies (5) 1944–1957
- Innerbelt studies (5) 1987–1999
- Travel behavior studies (2) 1997–1998
- Highway studies (2) 1995–1996
- Modal studies (9) 1998–2001
- Neighborhood or special-generator studies (6) 1993–2003.

### 1.5.4 Infrastructure Condition

Based on the findings of the analysis done in support of the Problem Statement, additional research into the condition of roadway pavements and bridges in the study corridor was completed.

### 1.5.4.1 Bridge Decks

***Central Viaduct Bridge***

The Central Viaduct Bridge (Bridge No. CUY-90-1524) carries I-90 over the Cuyahoga River Valley from Fairfield Avenue to Broadway Avenue. The bridge is composed of three structures:

- The rear approach structure, which spans over Fairfield Avenue, Abbey Avenue, and University Road
- The main spans or truss spans, which spans over the Cuyahoga River, industrial areas, Norfolk-Southern trestle, Harrison Street, West Fourth Street, West Third Street, CSX tracks, and Canal Road
- The forward approach structure, which spans over the Commercial Road, Greater Cleveland Regional Transit Authority Tracks, and Broadway Avenue (SR 8, SR 14, and USR 422).

In 1997 and 1998, the Central Viaduct Bridge was evaluated by Richland Engineering, Limited. As a result of the study, two sets of repairs were performed in 1997 to address a slope failure and major deficiencies with the bridge deck. The bridge was also sealed with a high-molecular-weight sealant in order to extend the remaining useful life until the beginning of the anticipated renewal period (2008). The 1998 condition survey determined that chloride ions are present in sufficient concentrations within the bridge deck of the Central Viaduct Bridge to cause the corrosion of the reinforcing steel. In fact, corrosion of the reinforcing steel was observed in 33 percent of the samples, corrosion of the stay-in-place deck forms was observed in 30 percent and delamination of the bridge deck was observed in 10 percent of the samples. These findings are consistent with findings on other interstate bridge decks of similar age and construction.

Based on findings of their 1997 and 1998 reports, Richland Engineering, Limited, recommended that the bridge's deck and stringers be replaced between the years 2003 and 2008.

The bridge was inspected in the fall of 2000 as part of the Cleveland Innerbelt Study. The purpose of this inspection was to perform a hands-on, in-depth inspection of all bridge components and to gather data for a load-rating analysis of the truss portion of the structure. Conclusions are that the Central Viaduct bridge deck is in poor condition except for the new portion in the east approach structure. The deck on the truss spans has an estimated remaining life of six to eight years. The concrete wearing surface overlays are also in poor condition. The superstructure is in poor condition due to damaged floor beams and stringers. The number of fatigue cracks in the truss stringer ends increases every year. The truss chords, diagonals, verticals, and bracing are in fair condition; the truss analysis shows that the bridge can safely carry all legal and permitted loads with strength to spare. The substructure is in satisfactory condition showing cracks and spalls. The general appraisal rating of the bridge is poor. However, this is due entirely to the damaged stringers and floor beams. Other preventive maintenance and repairs needed in the near future include:

- Cleaning and repairing the drainage system
- Repairing and sealing the truss piers
- Stiffening the edges of main gusset plates as required
- Cleaning and painting of structural steel
- Replacing/repairing the bearings at approach span cross girders and trusses
- Retrofitting the bottom flanges of the built-up girders at the bend points in the east approach under the remaining old deck.

***Other Bridges***
In addition to the Central Viaduct Bridge, 24 other bridges are involved, as listed below.

- South and west of the Central Viaduct Bridge – 10 bridges, including all of the mainline bridges of the Innerbelt, as well as all of the bridges within the two interchanges of I-71 and SR 176, and I-90 with I-71 and I-490
- North and east of the Central Viaduct Bridge – 13 bridges, including all of the mainline bridges of the Innerbelt, as well as all of the bridges within the central interchange of I-90 and I-77
- The Lakefront Interchange Bridge, I-90 and SR 2.

All of the bridges are rated between four and six (out of 10) according to the *ODOT Bridge Inspection Manual*. A rating of six or below indicates deficiencies, and a rating below three indicates bridge failure.

***Subsurface Investigation***
Bridge foundations in the study area are predominately cast-in-place, reinforced concrete, friction piles. Aggregate stockpiles offset more than 75 feet from the Central Viaduct Bridge piers should not cause settlement to the soil adjacent to the piers.

***Summary of Bridge Decks and Anticipated Need to Replace***
The decks of all of the Innerbelt bridges are currently between 33 and 43 years of age, and at the end of the ten-year anticipated renewal period (2017), these decks will be between 47 and 57 years of age. All of these bridges still have their original decks. Based on the performance of other interstate bridges of similar age and construction, the Ohio Department of Transportation anticipates the need to replace all of the bridge decks prior to the end of the anticipated renewal period (2017). With a total of 1.2 million square feet of bridge deck that requires replacement within a 10-year period, it is necessary to develop a strategy to systematically replace the bridge decks, while minimizing disruptions caused by construction activities.

### 1.5.4.2 Pavements

The roadway pavements of the Innerbelt Freeway are of similar age, similar construction, and similar condition, and based on projected physical conditions, all of the roadway pavements should be scheduled for rehabilitation in the decade between 2008 and 2017.

The Ohio Department of Transportation has developed a Pavement Management System (PMS), which uses the Pavement Condition Rating (PCR) system to rate the condition of the pavement. Based on a visual inspection of the roadway pavement surface, the PCR provides an index that reflects the composite effects of varying types of distress, the severity, and the extent the distress has affected the condition of the roadway pavements. A PCR of 100 represents a perfect or new roadway pavement with no observable distress; and a PCR of zero represents a roadway pavement with all distress types present at high levels of severity and extent. The Ohio Department of Transportation's Pavement Design and Selection Process recommends the following rehabilitation be undertaken for the following PCRs:

- A PCR between 75 and 55 – Minor rehabilitation of the roadway pavement, which typically consists of milling the roadway pavement surface, repair of transverse joints and transverse cracks, and asphalt overlay. Joint repair is considered economical for repair quantities up to 10 percent of the roadway pavement surface area. Minor rehabilitations requiring repairs greater than 10 percent may be promoted to major rehabilitations
- A PCR below 55 – Major rehabilitation of the roadway pavement, which may include the complete removal and replacement of the roadway pavement.

The PCR rating for all of the roadway pavements is predicted to fall below 75 during the anticipated renewal period. Therefore, all of the Innerbelt Freeway roadway pavements will require at least a minor rehabilitation within the anticipated renewal period. The selection of the type of rehabilitation (minor or major) will be determined based on additional analysis to be conducted as a part of the Cleveland Innerbelt Study.

With a total of 3.8 million square feet of roadway pavement requiring rehabilitation within a 10-year period, it is necessary to develop a strategy to systematically rehabilitate all of the roadway pavements, while minimizing disruptions caused by construction activities.

### 1.5.5 Traffic Safety Conditions

#### 1.5.5.1 Socioeconomic Data

The NOACA region is projected to remain stable over the next 25 years. The Cleveland Innerbelt study corridor is projected to see the highest population growth in the region, 17.7 percent by 2025, attributable almost entirely to growth in the Central Business District (CBD). The population of the study area is projected to increase 9.4 percent in the next 25 years. Employment in the corridor and study area is expected to remain relatively constant. For the region, person trip growth is expected to be less than 3 percent more than year 2000 levels.

Cuyahoga County will remain as the major trip producer and attractor of inter-county traffic in the region. Geauga, Lake, Lorain, and Medina Counties will maintain their current levels and share a majority of their inter-country traffic with Cuyahoga. Highway traffic measured in terms of vehicle miles of travel (VMT) increases almost 20 percent because of growth in commercial vehicle and external trips, while internal trips will remain stable. A further

indicator of increased congestion in the region and the corridor is vehicle hours of delay (VHD), which is projected by the year 2025 to grow by 130 percent for the region and 26 percent for the corridor.

Transit usage is expected to increase only by 2 percent over the next 25 years, if no changes are made to the transportation network. Also of note is the clearly identifiable trend for work-related auto trips to carry only one person in the car. For home-based work trips using automobiles, only 5 percent of these trips carry two persons, and less than 1 percent of the trips carries three or more people.

In terms of corridor vehicle through-movements, the current configuration of the freeway system in the area near the Cleveland CBD causes the portion of the Innerbelt from the Central Interchange to the Shoreway to function like the neck of a funnel. Traffic traveling through the study area on the freeways is funneled from I-90, I-71, I-77, and the Jennings Freeway in the south onto the Innerbelt. Traffic coming from the north along the Innerbelt is distributed to I-90, I-71, I-77, and the Jennings Freeway. This funnel-like distribution causes a large imbalance in through traffic movements in the study area. Through-traffic coming from the north and going to points south is a much larger percentage of the total traffic than through-traffic coming from the south. This condition is due in part to the existence of several freeway by-pass routes in the southern part of the study area. Travelers driving from the north must travel the Innerbelt to reach the southern portions of the freeway network.

#### 1.5.5.2 Systems Inventory

As part of the data collection effort for this study, a traffic count program was undertaken. Counts were taken at 382 locations in the study area over a period of approximately 6 months. These counts included:

- 6 freeway segment counts
- 120 ramp counts
- 43 ramp terminal intersection counts
- 184 arterial intersection counts
- 29 cordon counts, taken at arterial, ramp, and freeway segment locations.

#### 1.5.5.3 Levels of Service (LOS) and Running Speeds

A signal timing and intersection geometry inventory was collected for most major intersections in the study area. Two measures of operation performance are levels of service (LOS) and running speeds.

LOS measures performance on a freeway related to speed and travel time, freedom to maneuver, traffic interruption, and comfort and convenience. LOS has six ranks, A through F. A LOS of D is considered the lowest acceptable level; a LOS of E or F is considered unacceptable:

- A freeway operating at an LOS D provides limited freedom to maneuver. Even minor incidents can be expected to create queuing, because the traffic stream has little space to absorb disruptions
- A freeway operating at the lower boundary of LOS E provides virtually no usable gaps in the traffic stream. At capacity, the traffic stream has no ability to dissipate even the most minor disruptions, and any incident can be expected to produce a serious breakdown with extensive queuing
- LOS F describes breakdown in vehicular flow.

During the AM and PM peak periods, extensive portions of the Innerbelt operate at LOS D or below. Under normal operating conditions, when all lanes are open and available, the traffic stream has little or no ability to dissipate even minor disruptions. The entire length of the corridor lacks adequate median shoulders. The Central Viaduct Bridge also lacks adequate outside shoulders. Thus, there is little or no opportunity to use the shoulders to supplement the capacity of the Innerbelt Freeway. These challenges necessitate the development of a comprehensive strategy for the systematic renewal of the transportation infrastructure that will minimize the disruption caused by construction activities.

During the morning rush hour (AM peak) the northbound Innerbelt Freeway currently operates at unacceptable levels of service (E or F) and low speed to stopped conditions from the West 25$^{th}$ Street/Fulton Avenue area northbound to the SR 176 merge. I-90 operates at these unacceptable levels of service from the I-71/I-90/I-490 interchange northbound to the Central Interchange. The rest of the facility (except for selected ramps) operates at acceptable peak hour levels for urban areas (Figure 1-4).

During the evening rush hour (PM peak) the Innerbelt facility currently operates at unacceptable levels of service (E or F) from east of the Innerbelt Curve southbound through the Central Interchange and continuing southbound to the I-71/I-90/I-490 interchange. I-71 operates at these unacceptable levels for a short distance southbound just north of the SR 176 exit. The rest of the facility (except for selected ramps) operates at acceptable levels for urban areas (Figure 1-5).

Due to the fact that sections of the Innerbelt already operate at or near capacity, the modest increase in travel projected will cause some sections of freeway that are exhibiting poor operational performance (LOS E) to fail (LOS F). Operating conditions need to be improved to achieve a minimum LOS of D.

Figure 1-4:

# 2000 AM Peak Level of Service


B&N URS TEAM

Figure 1-5:

# 2000 PM Peak Level of Service


B&N URS TEAM

### 1.5.5.4 Design Deficiencies

The design of the Innerbelt predates development of modern standards for the design of freeways. As a result, there are numerous locations along the Innerbelt that do not meet current freeway design standards (Figure 1-6). Three types of design deficiencies in particular contribute to the safety and operational performance problems:

- Improper reductions in the basic number of lanes (freeway). Two locations on the Innerbelt have lanes that have been improperly reduced:
  NB 1-71 south of the SR 176 merge (3 lanes to 2 lanes)
  - WB I-90 at the interchange with SR 2 (four lanes to two lanes).
- Inadequate acceleration, deceleration, or terminal-spacing and weave lengths (freeway ramps). There are 14 locations on the Innerbelt with design inadequacies of this type. These locations are concentrated primarily in the area of I-90 between the Central Interchange and the Lakefront (SR 2) Interchange
- Inadequate curve radius (freeway mainline). There are two locations on the Innerbelt where the curve radius is less than the required minimum: WB I-90 at SR 2 and EB I-90 at SR 2.

### 1.5.5.5 Crash Analysis

Freeway crash data was obtained from the Ohio Department of Public Safety (ODPS) database for the three-year period of 1997 through 1999. The "2000 Motor Vehicle Accident Report," June 2002, published by NOACA was used as a reference. The "2000 Motor Vehicle Accident Report" provides crash trends for the northeast Ohio region and for all of Ohio.

The average crash rate for a typical freeway segment in northeast Ohio is 1.2 crashes per million vehicle-miles. Figure 1-7 summarizes the results of the freeway crash analysis. Freeway segments in the study area with less than 1.2 crashes per million vehicle miles are shown in light green, segments between 1.2 and 2.5 crashes per million vehicle-miles are shown in yellow, and segments over 2.5 crashes per million vehicle-miles are shown in dark red.

On average, nearly 18 percent of all freeway crashes in the study area occur during the AM and PM peak periods (7:00-9:00 AM and 4:00-6:00 PM). Of those crashes, 44 percent are classified as "severe" (injury or fatal crashes).

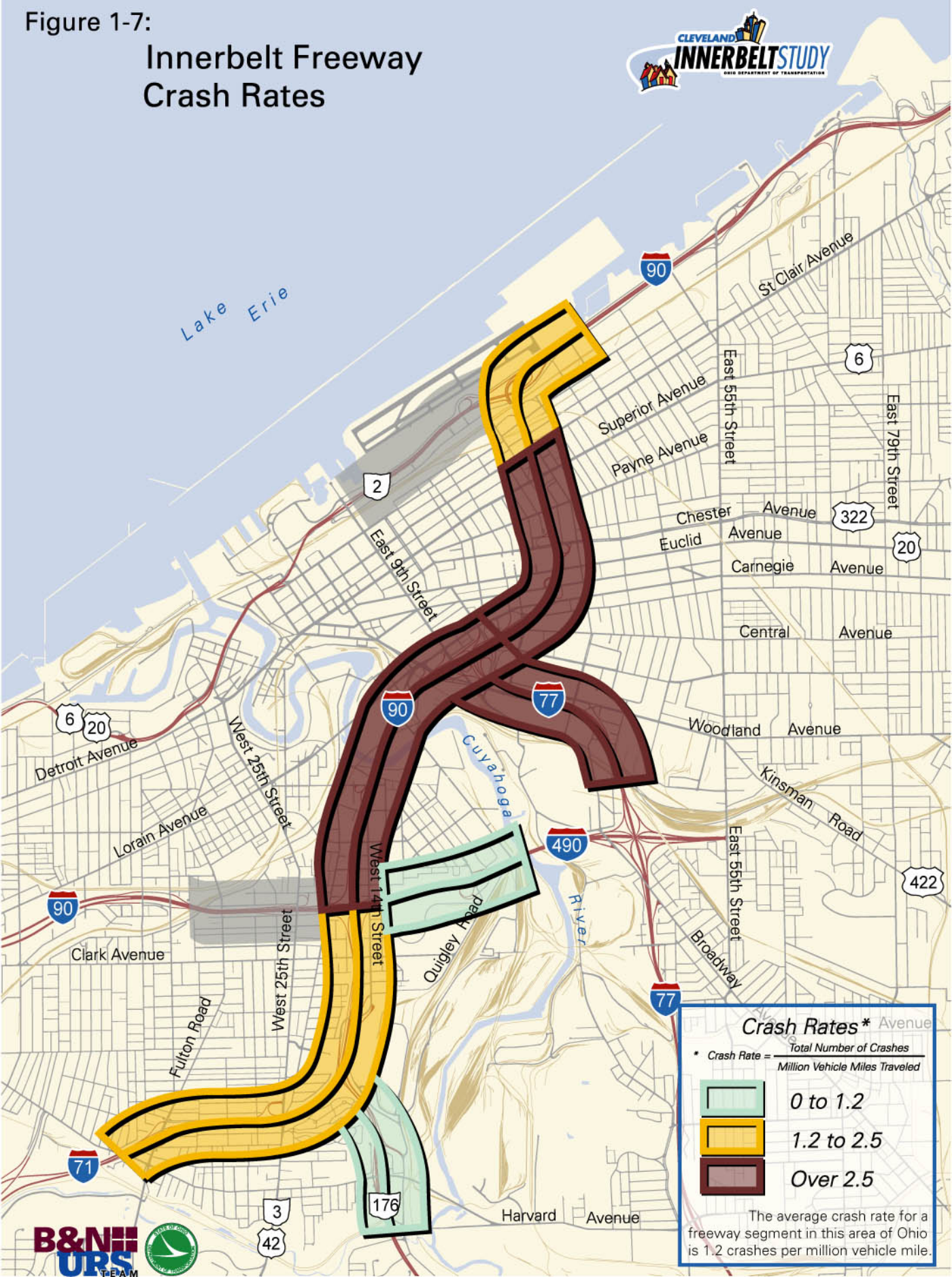
:

Figure 1-6:

# Locations That Do Not Meet Current Design Standards

Figure 1-7:

# Innerbelt Freeway Crash Rates



The following list is the ten crash locations with the highest crash ratings. This category most accurately depicts the problem intersections within the project area. Note that hazardous intersections cannot be determined solely by crash rate, crash severity, or frequency. A more accurate way to identify problem intersections is to take into account all three factors. Therefore, the following list was determined by averaging the three different rankings of crash rate, crash severity, and frequency of crashes

| | | |
|---|---|---|
| 1. | Carnegie and E. 30th | 1.67 |
| 2. | Carnegie and Ontario-Broadway | 2.33 |
| 3. | E. 9th and Lakeside | 4.33 |
| 4. | Woodland and E. 55th | 5.00 |
| 5. | E. 9th and St. Clair | 5.00 |
| 6. | E. 9th and Carnegie | 6.33 |
| 7. | W. 25th and Lorain | 9.33 |
| 8. | E. 9th and Prospect | 10.67 |
| 9. | E. 55th and Euclid | 11.33 |
| 10. | E. 9th and Euclid | 11.67 |

### 1.5.5.6 W. 14th Street Cut-Through Traffic

It is a neighborhood concern that, due to heavy congestion on the Innerbelt northbound during the AM peak, many vehicles are exiting the Innerbelt at the W. 14th Street and Holmden Avenue ramps. These vehicles subsequently reenter the Innerbelt at the W. 14th Street/Fairfield Avenue ramp just north of the I-90/I-490 merge. In order to determine the amount of traffic attempting to "short-cut" this I-71 congestion, a traffic flow analysis in the affected area was conducted.

All traffic counts along W. 14th Street were collected on the same, incident-free day (see Figure 1-8). It was determined that 2700 drivers are exiting onto W. 14th Street from the freeway and approximately 1100 to 1400 of these drivers are reentering the freeway at the W. 14th Street/Fairfield Avenue ramp.

From a traffic safety standpoint, it was noted that the crash rates at the intersections along the W. 14th Street corridor are all less than 1.01 crashes per million entering vehicles. Although this crash rate is less than the average for the study area, the higher crash exposure caused by the amount of this "short-cut" traffic results in a greater number of crashes along W.14th Street than would otherwise occur.

### 1.5.6 Access

Access refers to the relative ease by which the locations of activities, such as work, health care, education, shopping, and recreation, can be reached from another location. The Innerbelt provides access to the Central Business District (CBD) and the various residential neighborhoods and commercial/industrial areas immediately adjacent to downtown Cleveland.

FIGURE 1-8:

# West 14th Traffic Count Locations

The 2-mile section from the Central Interchange to the SR 2 interchange provides access to Broadway/Ontario, East 9th Street, East 14th Street, East 18th Street, E 22nd Street, Carnegie Avenue, Prospect Avenue, Chester Avenue, Superior Avenue, St. Clair Avenue and Lakeside Avenue, through a series of service interchanges, containing a total of 11 exit ramps and 12 entrance ramps. This does not include the eight freeway-to-freeway ramps within the two system interchanges, or the 10 service interchange ramps serving the I-77 leg of the Central Interchange.

If the East 14th Street/East 18th Street, Carnegie Avenue/Prospect Avenue and Superior Avenue/St. Clair Avenue pairs are considered as single interchanges, then there is seven service interchanges within this 2-mile section of freeway. This equates to an average interchange spacing of slightly more than one-quarter mile. The ODOT Design Manual recommends a minimum interchange spacing of one mile in urban areas. The actual spacing should be determined by weaving requirements, required lengths of speed change lanes, and the capacity of the freeway mainline. Further, acceleration, deceleration, weave, and terminal spacing lengths are inadequate and adversely affect the operational performance and safety of the Innerbelt Freeway. The ability to eliminate these design deficiencies, and thus the ability to improve the operational performance and safety of the Innerbelt Freeway, is a function of the service interchange spacing. Expressed another way, the current average service interchange spacing of one-quarter mile, severely limits the potential to improve operational performance and safety.

### 1.5.7 Transit Operations

Rehabilitation of the Innerbelt will impact public transportation in the Greater Cleveland area. Both express and local GCRTA busses utilize segments of the Innerbelt as part of their routes. During reconstruction of the Innerbelt Corridor, service reliability on these routes will be impacted. Further, during the construction period, public transportation also could significantly relieve the congestion that may result.

#### 1.5.7.1 Bus Operations

The Greater Cleveland Regional Transit Authority (GCRTA) is the primary transit provider in the Cleveland area, especially in the Corridor study area. However, with the large population centers immediately adjacent to the Cleveland metropolitan area, a significant amount of commuter trips into downtown Cleveland is provided by other bus services, such as Laketran and METRO. Laketran is the bus-service provider for Lake County, the county immediately northeast and adjacent to the GCRTA service area. Laketran presently provides express bus service over four scheduled routes along SR-2 and I-90 from dedicated park-n-ride facilities to downtown Cleveland. METRO, the bus-service provider for Summit County, immediately adjacent to and south of the GCRTA service area, provides four dedicated express runs along I-77 into downtown Cleveland.

Overall ridership figures for GCRTA for 1999 show an average of 169,000 bus trips per day and 49,140,000 trips for the year, for a total of 206,564,400 passenger miles. Ridership

figures for 2000 for all combined Laketran and METRO routes servicing Cleveland show 204,100 trips for the year.

GCRTA provides main-line scheduled bus service in Cleveland and surrounding suburbs in Cuyahoga County, with 102 routes covering 1,108 route miles. Of these 102 routes, 80 percent of the ridership is from Local/Radial and Crosstown/Feeder routes, with the other 10 percent from Express/Flyer, downtown loop, and other supplemental routes. Thirteen of these routes use the Innerbelt Viaduct to travel to and from the downtown area. These routes would suffer the greatest direct impact of any major work or shutdown on the Viaduct. Preservation of this service must be considered during the development of rehabilitation plans for the Viaduct.

### 1.5.7.2 Rail Operations

GCRTA also provides rail rapid transit in the Cleveland area with three rail lines (Red, Blue and Green) and the Waterfront extension, containing 49 stations. Using 108 vehicles, the rail transit lines have approximately 30 miles of lines. The Red line is a heavy rail or high platform system operating on a dedicated right-of-way from the Windermere Station through Tower City Center to the Hopkins International Airport. The Blue and Green Lines are light rail, low platform services that operate in street-running mode for much of their routing. They were constructed primarily to serve the City of Shaker Heights. The Waterfront Line operates as an extension of the Blue and Green Lines into the east bank of the Flats and along the Cleveland Lakefront. Over 9.8 million riders used the GCRTA rail transit lines in 1999. Approximately 33,600 used the rail transit lines during an average weekday in 1999.

GCRT is currently considering three potential extensions of GCRTA rail transit service:

- Red Line extension to Berea and beyond
- Blue Line extension to the vicinity of Harvard Avenue/I-271
- Waterfront Line extension into the Central Business District.

### 1.5.7.3 Potential Role of Bus and Rail Transit During Rehabilitation

Bus transit service has the potential to carry additional passengers during the Innerbelt rehabilitation, thereby helping reduce the traffic congestion that could result from construction. Possible improvements to bus transit capacity include:

- Operating more frequent bus service from selected park-and-ride facilities. This may require additional buses and the expansion of park-and-ride facilities
- Designating dedicated or priority lanes for buses on certain streets
- Operating increased bus service on selected routes. This may require additional buses.

Rail transit lines also could carry additional passengers and help relieve the congestion from construction on the Innerbelt. Currently, each rail line operates below full capacity. If construction results in ridership increases reaching capacity, operational provisions or changes could increase passenger capacity on the rail lines. Possible operational changes include:

- Longer trains. This change may require additional vehicles, longer station platforms, and adjustments to the train control system. Increased parking at the stations and improved provisions for bus feeder operations may also be required
- More frequent trains. This change may require additional vehicles and adjustments to the train control system. Increased parking at the stations and improved provisions for bus feeder operations may also be required.

Other means of carrying additional passengers on the rail transit lines include providing direct, or improved, access from freeways or major arterials into the station parking lots.

### 1.5.8 Natural Environment and Social Conditions

An overview of the natural and social conditions in the study area was conducted as part of the Cleveland Innerbelt study. Information for these conditions was collected from available secondary sources.

#### 1.5.8.1 The Natural Environment

***Geology –*** The study area is encompassed by delta and relatively flat lake plain. To the east and south of the delta and lake plain are hillsides and areas of higher elevation. The soils in the study area were formed from lake plain sediments and glacial deposits, and the bedrock underlying the area is Devonian shale to a depth of more than 100 feet. Depth to bedrock is generally more than 60 inches. General soil types in the study area include Loamy Udorthents, Urban Land, Undulating Mahoning Complex Urban Land, Undulating Oshtemo Complex Urban Land, and Elnora Complex Urban Land. Erosion potential in the lake plain area is limited due to soil types, the absence of steep slopes, and the generally developed urban nature of the area.

***Floodplains –*** Within the study area, there are 100-year floodplains associated with the major watercourses, including the Cuyahoga River, Burke Brook (tributary to the river), and Doan Brook. The floodplains are very narrow, confined within the channels of the watercourses. There is also a 100-year floodplain associated with Lake Erie that affects the immediate shoreline from the mouth of the Cuyahoga River to the mouth of Doan Brook, encompassing Gordon State Park, Edgewater Park, and many other fill areas waterward of the major development complexes, such as the Airport and the Stadium.

***Drinking and Ground Water –*** Drinking water in the study area is supplied by the City of Cleveland, Division of Water and comes from Lake Erie. Lake water is obtained at crib intakes and treated at four filtration plants, three of which serve portions of the study area: the Baldwin, Crown, and Division plants. The water is then distributed by the City's pipeline distribution network. Groundwater yields within the study area tend to be very low, rendering the area generally unsuitable for well development.

***Wetlands –*** The greatest concentrations of wetlands in the study area occur along the Cuyahoga River, Burke Brook, Doan Brook, Lake Erie, and various rail lines. Wetlands

occur relatively continuously along the Cuyahoga River, but primarily on the west side, typically as fringes along the water. Extensive wetlands are associated with Burke Brook in Newburg Heights, in the vicinity of Washington Park, and the I-77 crossing of the brook between Harvard and Fleet Avenues. Doan Brook also has a concentration of wetlands, located in the section between St. Clair Avenue and the Conrail crossing, as does the vicinity where Woodhill and Quincy Avenues converge. On Lake Erie, wetlands occur mostly along the Port Authority docks, the Coast Guard bay, and the yacht club basin northeast of the Burke Lakefront Airport. Several pockets also exist where Kingsbury Run used to flow openly. Outside these areas, wetlands appear to be almost always located adjacent to rail lines.

***Bodies of Water –*** The majority of the study area—the central and southern portions—is within the Cuyahoga River watershed, such that runoff and drainage from the land surfaces in these portions drain into the river, primarily through its tributaries. Tributaries to the Cuyahoga River within the study area include Walworth Run, Kingsbury Run, Morgan Run, and Burke Brook. These tributaries form valleys over 100 feet deep, separating the neighborhoods/land uses on either side. The Cuyahoga River is used for commercial shipping and recreational boating. The navigation channel extends approximately 5 miles south of Lake Erie. The river valley rests 70 to 100 feet below the adjacent terrain, having cut a channel into the sedimentary bedrock over geologic time. Along the banks of the river bulkheads of steel and concrete, as well as stone and other materials, have been used extensively to support the industrial and other land uses on the valley floor, particularly in the Flats Oxbow area.

A 100-mile-long stretch of the Cuyahoga River has been designated under the American Heritage River Initiative. In 1996, Congress established the Ohio & Erie Canal National Heritage Corridor, which extends 87 miles from Zoar in Tuscarawas County to Cleveland's lakefront. The Heritage Corridor is a regional park system that encompasses a mix of public and private lands, buildings, and communities, and follows the route of the old towpath along the Ohio and Erie Canal. The proposed northern entrance to the corridor is Lock 44, located on the east side of the Detroit-Superior Bridge (SR 6) in the study area. The towpath continues south along the east side of the Cuyahoga River.

***Habitats –*** Because of the heavy urbanization of the study area, natural habitats are restricted throughout, generally limited to the larger parks and the undeveloped fringes of wetlands and shorelines of the major watercourses and Lake Erie. In addition to habitat reduction, fish and wildlife diversity has been diminished due to the water quality of the Cuyahoga River, which has been impacted by pollution and low levels of dissolved oxygen. Nonetheless, there are several Natural Heritage records in the study area, all of which are located along Lake Erie or the Cuyahoga River. Additional details on habitats found in the study area are available in Chapter 6 of the Existing and Future Conditions Report.

***Endangered Wildlife –*** Potentially state-threatened plants include Richardson's pondweed (*Potamogeton richardsonii*), sand dropseed (*Sporobulus cryptandrus*), Schweinitz's umbrella sedge (*Cyperus schweinitzii*), and seaside spurge (*Euphorbia polygonifolia*). In the study area, there are also records of a state-threatened plant, the Canada hawkweed (*Hieracium*

*canadense)*, and an endangered plant, dotted horse-mint (*Monarda punctata*). A state-threatened wildlife species is found in the study area—the upland sandpiper (*Bartramia longicauda*)—and ODNR notes that there are breeding colonies of ring-billed gull (*Larus delawarensis*) and herring gull (*Larus argentatus*) along Lake Erie. One fish species, the muskellunge (*Esox masquinongy*), is documented to inhabit in Lake Erie within the study area. Coordination with the U.S. Fish and Wildlife Service (USFWS, April 23, 2001) has highlighted the potential occurrence of two federally listed or candidate species and the known occurrence of one federally listed species within the study area. The project lies within the ranges of the Indiana bat, a federally endangered species, and the eastern massasauga, a candidate federal species and state-endangered species.

***Farmlands –*** There is one small area of prime farmland in the study area, based on the most recent NRCS list of prime farmland soils (July 14, 2000). It is an area of Tioga loam, frequently flooded (soils map symbol Tg), that occurs as a narrow band along Doan Brook at the eastern tip of the study area. No active farming or other agricultural use, however, currently takes place there.

***Environmental risk sites –*** The project study area has an extensive history of industrial and commercial use. Figure 1-9 shows the locations of environmental risk sites in the study area. These are regulated sites known or suspected to pose environmental problems from chemical or other contaminants. Two solid waste landfills associated with LTV Steel Company and the Newburgh Heights Harvard Road Transfer Station are known to exist within the study area. Twenty-three sites within the study area have been the subject of major state cleanup actions and there are also seven Superfund (CERCLIS) sites. Seventeen facilities have been the subject of Resource Conservation and Recovery Act (RCRA) Corrective Action Programs. In addition, 101 large-quantity and 268 small-quantity RCRA generators of hazardous wastes have been actively registered over the past 30 years. Approximately 55 RCRA transporters are located in the study area, and 221 facilities are currently listed under the Emergency Right to Know Act. The State of Ohio Environmental Protection Agency lists 417 occurrences of leaking underground storage tanks in the study area.

### 1.5.8.2 The Social Environment

The City of Cleveland is a multifaceted urban area with land use in the study area reflecting that condition. Land use in Cleveland has been monitored and mapped by the City of Cleveland Planning Department. Their most recent map (1999) for the study area portion of

FIGURE 1-9:


Environmental Risk Sites
CLEVELAND INNERBELT STUDY
OHIO DEPARTMENT OF TRANSPORTATION
Solid Waste Landfill
Federal CERCLIS Site
State CERCLIS Site
LUST Site
Lake Erie
Doan Brook
Kingsbury Run
Walworth Run
Morgana Run
Big Creak
Cuyahoga River
Detroit Ave
Lorain Ave
Madison Ave
Clark Ave
Denison Ave
Quigley Rd
Fulton Rd
Scranton Rd
Broadway
Union Ave
Harvard Ave
Woodland Ave
Quincy Ave
Central Ave
Cedar Ave
Prospect Ave
Euclid Ave
Carnegie Ave
Chester Ave
Payne Ave
St. Clair Ave
Superior Ave
Shaker Blvd
Kinsman Rd
Woodhill Rd
Lakeview Rd
Martin Luther King Jr. Dr
E 9th St
E 12th St
E 17th St
E 55th St
E 105th St
W 14th St
W 25th St
W 73rd St
Independence Blvd
90
77
71
490
2
283
6
322
20
87
422
10
3
42
176
43
14
87
8
20
6

the City (cross referenced with Cuyahoga County Planning mapping) is shown on Figure 1-10.

The following table indicates the acreage for each major land use in the study area as a percentage of the study area total.

**Table 1.1 Land Use in the Innerbelt Study Area**

| Land Use | Percentage of Total |
|---|---|
| Industrial | 28.61% |
| Mixed Use | 22.24% |
| Residential | 17.65% |
| Institutional | 13.91% |
| Commercial | 5.86% |
| Vacant | 5.43% |
| Open Space | 3.30% |
| Utilities | 3.00% |

*Source: City of Cleveland, 2001*

Citywide development patterns have historically been shaped by the opportunities and constraints of the region's natural resources. The Cuyahoga River and the area of the Flats was the early economic and transportation hub of the City. Industrial development followed the development of the rail lines. The rivers, streams, valleys, and hillsides formed the early boundaries of residential neighborhoods. Many of those development patterns persist today.

The City of Cleveland has established planning areas generally referred to as neighborhoods. These neighborhoods, however, do not necessarily correspond to the service areas of the Community Development Corporations. There are 16 neighborhoods that may be directly influenced by projects recommended by this study process. Most of these neighborhoods fall fully or partially within the study area. Detailed characteristics of each of the affected neighborhoods are provided in the neighborhood overview Table 1.2.

The comparative trends in population change for the study area are shown in Table 1.3. Like many urbanizing areas, the Cleveland metropolitan area experienced a loss of population to the suburbs over the last two decades. It is expected that Cuyahoga County and the City of Cleveland will see a slight increase in population over the next 25 years from revitalization of the region as a whole. However, due to infill development, neighborhood revitalization, and the ongoing increase in new residential units in the Cleveland urban core, the study area will likely experience a stronger growth in population then the City as a whole over the same time period.

FIGURE 1-10:

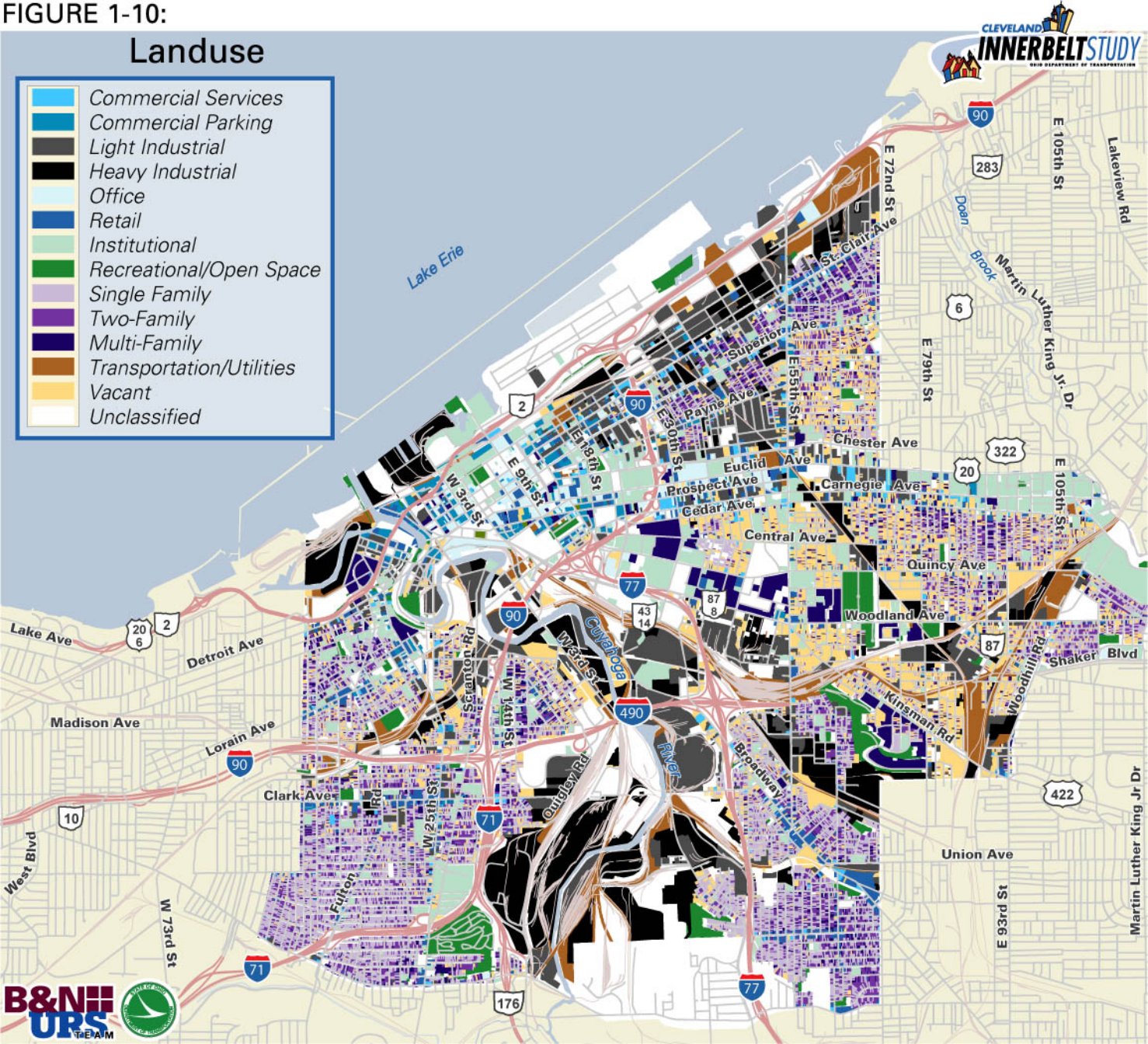

Landuse
Commercial Services
Commercial Parking
Light Industrial
Heavy Industrial
Office
Retail
Institutional
Recreational/Open Space
Single Family
Two-Family
Multi-Family
Transportation/Utilities
Vacant
Unclassified
CLEVELAND INNERBELT STUDY
Lake Erie
Lake Ave
Detroit Ave
Madison Ave
Lorain Ave
Clark Ave
West Blvd
W 73rd St
Fulton Rd
W 25th St
Quigley Rd
W 14th St
Scranton Rd
Ward St
Cuyahoga River
Broadway
E 9th St
W 3rd St
E 18th St
E 30th St
Payne Ave
Superior Ave
St. Clair Ave
E 55th St
E 72nd St
E 79th St
Doan Brook
Martin Luther King Jr. Dr
E 105th St
Lakeview Rd
Chester Ave
Euclid Ave
Prospect Ave
Cedar Ave
Carnegie Ave
Central Ave
Quincy Ave
Woodland Ave
Kinsman Rd
Woodhill Rd
Shaker Blvd
Union Ave
E 93rd St
Martin Luther King Jr Dr
90
2
20
6
77
71
176
10
490
43
14
87
8
283
322
422
B&N URS TEAM

**Table 1.2 Affected Neighborhoods – Overview [1]**

| Affected Neighborhoods | Total Acreage | Total Population | % Minority | % 65 Years or Older | % Below Poverty[3] | Total Employment[2] |
|---|---|---|---|---|---|---|
| Brooklyn Centre | 904 | 9,180 | 31 | 7 | 28 | 3,782 |
| Buckeye-Shaker | 745 | 16,063 | 85 | 13 | 23 | 7,078 |
| Central | 1,486 | 12,107 | 95 | 7 | 73 | 1,753 |
| Clark-Fulton | 629 | 13,363 | 39 | 8 | 32 | 4,379 |
| Detroit-Shoreway | 1,400 | 17,382 | 37 | 10 | 39 | 5,816 |
| Downtown | 1,958 | 5,960 | 63 | 7 | 24 | 1,862 |
| Fairfax | 870 | 7,352 | 98 | 19 | 48 | 1,893 |
| Glenville | 1,590 | 23,559 | 99 | 14 | 38 | 6,828 |
| Goodrich-Kirkland Park | 978 | 4,295 | 54 | 16 | 38 | 1,544 |
| Hough | 1,317 | 16,359 | 98 | 15 | 55 | 3,875 |
| Industrial Valley | 838 | 1,116 | 52 | 4 | 35 | 182 |
| Kinsman | 1,123 | 5,842 | 98 | 8 | 60 | 1,248 |
| Newburgh Heights | 293 | 2,389 | 6 | 14 | 12 | 1,077 |
| North Broadway | 1,092 | 9,049 | 47 | 10 | 33 | 3,111 |
| Ohio City | 1,187 | 9,308 | 45 | 10 | 50 | 2,809 |
| South Broadway | 2,307 | 21,475 | 24 | 11 | 20 | 8,635 |
| St. Clair-Superior | 916 | 11,410 | 82 | 9 | 42 | 3,325 |
| Stockyards | 946 | 8,616 | 30 | 9 | 28 | 2,910 |
| Tremont | 1,715 | 8,163 | 39 | 10 | 47 | 2,537 |
| University | 1,002 | 9,469 | 45 | 17 | 24 | 3,227 |
| Woodland Hills | 758 | 11,574 | 98 | 9 | 43 | 3,650 |
| **TOTAL** | **24,053** | **224,031** | **74** | **11** | **38** | **71,521** |

[1] *Source: 2000 Census.*
[2] *Resident population that was employed.*
[3] *1990 threshold for poverty for one individual was $6,652 annually (2000 data not available).*

**Table 1.3 Population Trends – Cleveland Innerbelt Study Area [1]**

| Area | 2000 Census Population | 2025 Projected Population[1] | Percent Change Growth 2000 - 2025 |
|---|---|---|---|
| Study Area | 289,030 | 298,544 | 3.3 |
| Affected Neighborhoods | 443,494 | 454,818 | 2.6 |
| Cleveland | 651,310 | 664,413 | 2.0 |
| Cuyahoga County | 1,399,954 | 1,427,860 | 2.0 |
| NOACA Region | 2,091,977 | 2,130,538 | 1.8 |

[1] *Source: NOACA Projections*

The City of Cleveland originally centered on manufacturing, warehousing, and transportation activity that took advantage of the Cuyahoga River and the development of freight rail lines

through the City. As noted in the *Civic Vision 2000, Citywide Plan*, in recent decades Cleveland's economy has undergone a shift from these historic activities toward greater diversification. Losses in the manufacturing sector have been offset by gains in the services sector.

Major employers are defined for this study as those having 500 or more employees. There are 53 major employers within the study area. There are also clusters of smaller employers in the study area. In 1993, there were over 125,000 workers in the CBD. In addition to the major employers noted above, there are a number of businesses and tourist attractions in the study area that may attract vehicle trips in substantial numbers.

Parks and recreation areas within the study area range from small local parks to large open space parcels. The core of the local recreation system is owned and operated by the City of Cleveland's Department of Parks, Recreation, and Properties. Major parks within the study area include those listed below. In addition, there are several small city-owned parks, recreation areas, and open spaces.

- Washington Park
- Gordon Park
- Fairview Park
- Brookside Metro Park
- The Park
- Edgewater State Park.

There are a number of recreational trails and cemeteries in the study area. These resources serve many of the same functions as the more-defined green spaces. They offer a source of passive recreation and/or a natural, green space in an urban setting generally dominated by buildings and pavement.

It has been the U.S. Department of Transportation's longstanding policy to actively ensure nondiscrimination under Title VI of the Civil Rights Act of 1964. Title VI states that "no person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." In 1994, President Clinton issued Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* providing that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

An environmental justice or "target" population area is one in which there is a concentration of either low income or minority as compared with a larger geographic region. The Federal Highway Administration (FHWA) has further stated that it is appropriate to discuss concentrations of other relevant populations such as elderly when considering potential project impacts on disadvantaged groups.

The information presented in the main report demonstrates that the majority of the study area can be considered to contain a concentration of environmental justice populations. There is a high concentration of those with significantly below average income throughout most of the study area. The locations of concentrations of individuals with no vehicle ownership closely mirror that of those with low income. The concentrations of minority and elderly populations are a little less widespread. Areas that do not contain a high concentration of environmental justice populations are generally also less populated areas or more newly developed. They occur along the western lakefront, downtown, and along the east bank of the Cuyahoga River. An example of the distribution of target populations is provided in Figure 1-11 for low-income populations.

### 1.5.9 Air Quality Conformity

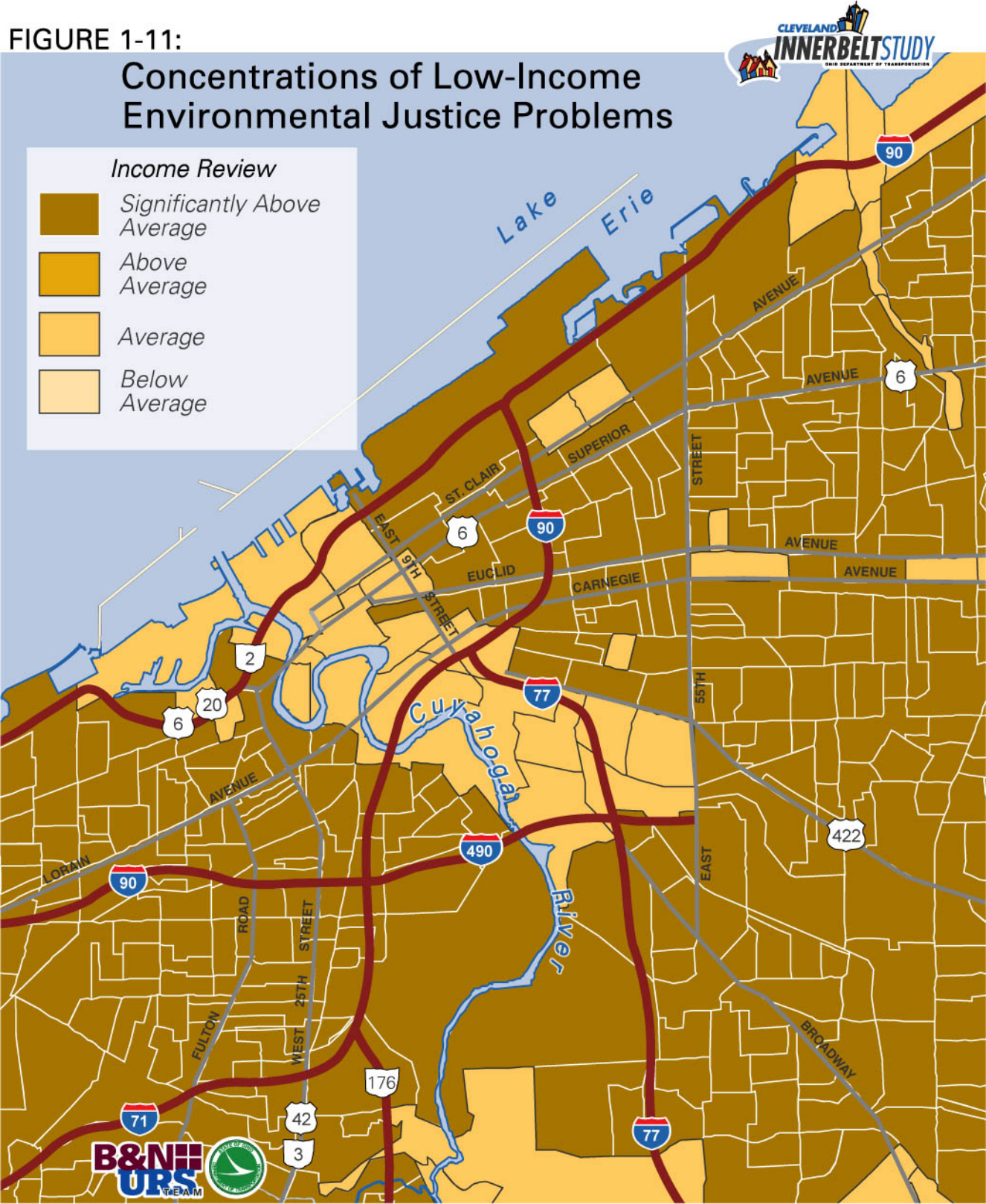
The entire project limits are within Cuyahoga County, Ohio. Cuyahoga County is designated by the U.S. Environmental Protection Agency (USEPA) as a maintenance area for ozone, carbon monoxide (CO), and particulate matter with an aerodynamic diameter less than 10 micrometers (PM10). Because the county is within an ozone maintenance area, transportation projects are subject to the provisions of regional transportation conformity, which requires that regional transportation plans and programs must not cause or contribute to any new air quality violations or increase the frequency or severity of existing violations. This requirement does not apply to individual projects; rather it is an analysis of all projects contained in a transportation plan or program.

The Northeast Ohio Areawide Coordinating Agency (NOACA) prepared an air quality conformity analysis on its Plan and TIP amendments. The TIP amendments include the Cleveland Innerbelt improvements to I-71/I-90/I-77 as well as the SR-2 reconstruction and widening in Lake County and the SR-2 Lakefront west reconstruction in the City of Cleveland, Cuyahoga County. Because these amendments affect capacity on the region's transportation systems, it is necessary, per the 1990 Clean Air Act Amendments and subsequent regulations, to perform the required analyses to ensure:

*Conformity to the (air quality implementation) plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and that such activities will not (i) cause or contribute to any new violations of any standards in any area, (ii) increase the frequency or severity of any existing violation of any standard in any areas, or (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.*

The complete conformity document will include documentation for all aspects of the analyses. This summary covers main points. The conformity analyses were conducted in accordance with the *Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act*, 40 CFR Parts 51 and 93, issued November 24, 1993 and subsequent applicable revisions, and in accordance with the *Ohio State Transportation Conformity Rules, Ohio Administration Code Part 3745-101-01 through 20*, issued August 21, 1995 and subsequent applicable revisions.

FIGURE 1-11:


Concentrations of Low-Income Environmental Justice Problems
CLEVELAND INNERBELT STUDY
OHIO DEPARTMENT OF TRANSPORTATION
Income Review
Significantly Above Average
Above Average
Average
Below Average
Lake Erie
Cuyahoga River
AVENUE
SUPERIOR
ST. CLAIR
EAST 9TH STREET
EUCLID
CARNEGIE
AVENUE
AVENUE
AVENUE
STREET
55TH
EAST
LORAIN
ROAD
WEST 25TH STREET
FULTON
BROADWAY
90
6
2
20
77
490
422
176
71
42
3
B&N URS TEAM

The results of the analyses, as displayed in Tables 1.4 and 1.5 for Hydrocarbons and Oxides of Nitrogen respectively, is that both projects conform to Ohio's State Implementation Plan because the projects:

- Contribute to the State Implementation Plan's purpose of eliminating and reducing ozone violations
- Produce emission burdens that are below the applicable budgets established in the State Implementation Plan
- Were prepared in accordance with current federal and state conformity guidance.

Since conformity analyses for this area must include the entire ozone maintenance area, the emissions from the applicable long-range transportation plans for the Akron Metropolitan Area Transportation Study (AMATS), and the County of Ashtabula are included in Tables 1 and 2.

**Table 1.4 Hydrocarbons Emissions Budget Test**

| **HYDROCARBONS (tons/day)** | **NOACA** | **ASHTABULA** | **AMATS** | **TOTAL** |
|---|---|---|---|---|
| 1993 Attainment Year | 115.71 | 12.30 | 53.39 | 181.40 |
| **2006 Budget** | | | | 92.70 |
| 2006 Emissions | 44.38 | 4.02 | 20.51 | 68.91 |
| 2015 Emissions | 19.52 | 2.07 | 10.25 | 31.84 |
| 2025 Emissions | 13.41 | 1.58 | 7.47 | 22.46 |

**Table 1.5 Oxides of Nitrogen Emissions Budget Test**

| **OXIDES OF NITROGEN (tons/day)** | **NOACA** | **ASHTABULA** | **AMATS** | **TOTAL** |
|---|---|---|---|---|
| 1993 Attainment Year | 102.25 | 12.10 | 45.55 | 159.90 |
| **2006 Budget** | | | | 104.40 |
| 2006 Emissions | 60.18 | 5.39 | 30.86 | 96.43 |
| 2015 Emissions | 20.50 | 2.33 | 12.86 | 35.69 |
| 2025 Emissions | 9.24 | 1.31 | 6.83 | 17.38 |

### 1.5.10 Historic and Prehistoric Resources

The Cleveland Innerbelt Study could potentially affect historic resources within and immediately adjacent to the project area. The Historic Preservation Act of 1966 requires that projects involving federal funds or actions must take into account potential adverse effects on properties listed on or eligible for the National Register of Historic Places. In addition to listing on the National Register, which constitutes official federal recognition of a resource's historic or architectural/design significance, the City of Cleveland has also designated its own list of landmark districts, buildings, and sites. The Cleveland Innerbelt Study will assess the impact of the project on designated Cleveland Landmarks districts and individually designated landmarks. Finally, to assess the potential impact of the project on archaeological

resources, the files of the Ohio Historic Inventory have been investigated, and a study of the overall archaeological character and potential of the area has been made.

Because the project area contains the oldest parts of the City of Cleveland, the number of historic resources and districts in the area is high. All or portions of fifteen National Register listed historic districts are within the Innerbelt project area. The Cleveland Landmarks Commission has also designated all or parts of eight National Register historic districts in the project area as local preservation districts. One Cleveland Landmarks district partially overlaps a National Register district, and two Cleveland Landmarks historic districts are not listed on the National Register at all, although they do contain buildings and sites that are individually listed on the National Register.

There are also 108 individually designated National Register properties within the project area and 131 individually designated Cleveland Landmark properties. While most of these resources are buildings, a few cemeteries and historic sites have received historic designation, and one National Register resource is a decommissioned submarine (*USS Cod*). In contrast, the Ohio Archaeological Inventory includes only a small number of archaeological sites within the project area.

Many of these resources are located near interstate highways or related structures that might be altered as part of the Cleveland Innerbelt redevelopment. Overall, there is a high potential for impacts on cultural resources as part of this project. It will be important to consider the potential impacts of redevelopment of the Cleveland Innerbelt on these historic, architectural and archaeological resources.

### 1.5.10.1 National Register Districts

Because of the large number of historic districts within the project area, the potential for impact on National Register listed districts is high. While it is difficult to predict the extent of specific impacts this early in the development of the Cleveland Innerbelt Study, the following properties have been identified as at high risk for negative impact because of their proximity to Interstates I-71, I-90, I-490, and interchanges, ramps, and other circulation features of the current Cleveland Innerbelt.

- Portions of Tremont Historic District: The western edge of the Tremont Historic District is near I-71. A large number of the district's key resources, including its distinctive churches, stand close to the interstate. The southeastern corner of Tremont Historic District is also near I-490 and contains St. Theodosius Russian Orthodox Cathedral, a property of major historic and architectural significance
- Portions of Brooklyn Centre Historic District: The northern edge of the Brooklyn Centre Historic District is near I-71. This zone includes many houses along Archwood Avenue that contribute to the historic character of the district
- Portion of Warehouse District near the Cleveland Memorial Shoreway: The Warehouse District includes a collection of architecturally and historically significant warehouses and commercial buildings dating from the 1850s through the 1930s. The Cleveland Memorial Shoreway (State Route 2) forms the northeast border of the

Warehouse District. Any changes to the Shoreway anticipated as part of this project could affect this part of the Warehouse District.

### 1.5.10.2 Cleveland Landmarks Historic Districts

Nine Cleveland Landmarks districts cover all or part of an existing National Register district. Of these nine Cleveland Landmarks districts, the only two currently identified as at high risk for potential impact are the Tremont and Warehouse Historic Districts. For the Tremont Landmark District, the main potential threat is the close proximity of the district's western edge to I-71. The portion of Brooklyn Centre that is listed as a Cleveland Landmark district is not close to I-71. For the Warehouse District, the reconfiguration of the Cleveland Memorial Shoreway could threaten the northwestern corner of the district.

This leaves two districts that are Cleveland Landmarks-only historic districts. It currently seems that the Market Square Landmark District is probably not at high risk for negative impact as part of the Cleveland Innerbelt Project. However, part of the Prospect Avenue Landmark District might be at risk for negative impact. Interstate 90 cuts through the western portion of the Prospect Avenue Landmark District, with a major interchange dividing the western portion of the district from a much larger section that lies to the east. Contributing resources of the district stand relatively close to this interchange, including Trinity Cathedral at East 22nd and Euclid Avenue and the Central YMCA at 2200 Prospect Avenue. Alteration of this interchange could adversely impact the district and its contributing resources.

### 1.5.10.3 National Register Properties Listed Individually

These properties were selected as high risk for negative impact based on their close proximity to I-71, I-90, I-490, or interchanges, ramps, or other circulation and access features associated with these interstate highways. These resources are not located within a National Register historic district unless otherwise indicated.

- Samuel Mather House (University Hall, Cleveland State University), 2605 Euclid Avenue
- Central YMCA, 2200 Prospect, and Trinity Cathedral, Southeast Corner of Euclid Avenue and East 22nd Street
- Walker and Weeks Office Building, 2341 Carnegie Avenue
- Universal Terminal Company Warehouse, 5451 North Marginal Road
- Riverside Cemetery Gatehouse and Chapel, West 25th Street North of Willowdale Street
- Jennings Apartments, 2711 West 14th Street (Tremont Historic District)
- Jones Home for Children, 3518 West 25th Street
- Pilgrim Congregational Church, 2592 West 14th Street (Tremont Historic District)
- Charles Olney House and Gallery, 2241-2255 West 14th Street (Tremont Historic District)
- St. Theodosius Orthodox Cathedral, 733 Starkweather Avenue (Tremont Historic District)

- Bradley Building (Root-McBride Building), 1220-1230 W. 6th Street (Warehouse Historic District).

### 1.5.10.4 Individual Cleveland Landmarks

The following list contains at-risk resources individually listed as both Cleveland Landmarks and National Register properties

- Jones Home for Children (near I-71 ramp)
- Samuel Mather House (near I-90)
- Central YMCA (near I-90)
- Trinity Cathedral (near I-90)
- Riverside Cemetery Gatehouse and Chapel (near I-71)
- Pilgrim Congregational Church (near I-71)
- Charles Olney House (near I-71)
- St. Theodosius Orthodox Cathedral (near I-490).

A few Cleveland Landmarks resources at high risk for negative impact are not listed individually on the National Register. However, almost all of these resources are contributing elements in National Register districts and therefore are listed on the National Register as district-contributing resources. Only Riverside Cemetery is not part of a National Register district, although the cemetery's gatehouse and chapel are part of the Brooklyn Centre Multiple Resource Area.

### 1.5.10.5 Archaeological Resources

The Ohio Historic Preservation Office (OHPO), located in Columbus, Ohio, and maintained by the Ohio Historical Society, was the source for all information regarding archaeological sites in the study area. The data set contains 24 known archaeological sites located within the study area and a few just outside of it. Researchers working on projects unrelated to the Cleveland Innerbelt have previously recorded these sites. The sites listed below are not necessarily the best examples of archaeological resources found in the area; therefore, no assumptions can be made without Phase I archaeological investigation. This data set gives only the locations of known sites and makes no attempt to discover new sites. The deliberate avoidance of known archaeological sites and of areas containing little or no development will be beneficial to the preservation of archaeological resources. Listed below are the sites located in the study area:

- Site 33-Cu-3 Cleveland Mound I, located on the present-day lot of a Methodist church on the corner of Erie and Euclid (Prehistoric)
- Site 33-Cu-4 Fort No. I, located in Newburg Township on Forest City Park Property (Prehistoric)
- Site 33-Cu-74 Greenhouse Site (Prehistoric)
- Site 33-Cu-319 W.B. Castle House Site (Historic)
- Site 33-Cu-324, located on the grounds of the National Register listed Dunham Tavern (Historic)
- Site 33-Cu-325 6002 Dibble Avenue (Historic)

- Site 33-Cu-326 5910 Dibble Avenue (Historic)
- Site 33-Cu-327 7195 Euclid Avenue on the grounds of the Bradley House (Historic)
- Site 33-Cu-331 1814 Fulton Avenue (Historic)
- Site 33-Cu-332 1814 Fulton Avenue (Historic)
- Site 33-Cu-334 Benton Myers and Company (Historic)
- Site 33-Cu-335 John Conner's Site (Historic), located in the Irishtown Bend community
- Site 33-Cu-336 Cuyahoga Steam Furnace Company (Historic)
- Site 33-Cu-337 Van Duzer Site (Historic)
- Site 33-Cu-338 Clinton House (Historic)
- Site 33-Cu-342 Gehring Brewing Company (Historic)
- Site 33-Cu-343 7 Rockwell Street (Historic)
- Site 33-Cu-344 100 Wood Street (Historic)
- Site 33-Cu-345 89 Wood Street (Historic)
- Site 33-Cu-346 96-94 Wood Street (Historic)
- Site 33-Cu-347 184-186 St. Clair (Historic)
- Site 33-Cu-348 188 St. Clair (Historic)
- Site 33-Cu-351 1323 Denison Avenue (Historic)
- Site 33-Cu-378 southeast corner of St. Clair Avenue and West 10th Street (Historic).

As stated above, when planning possible routes for the Cleveland Innerbelt, avoidance of known archaeological sites is always the most effective way of protecting cultural resources. If and where possible, lands already in use, such as existing road, rail, and City of Cleveland right-of-ways, should be utilized for the project. The only exception to the complete avoidance policy is in cases where known archaeological sites have been destroyed by construction in the past 50 years. Urban land that is not presently in use has the greatest potential for archaeological resources. For example, recreational lands, vacant parcels, and other undeveloped lands have a high potential for the existence of archaeological resources.

## 1.6 PURPOSE AND NEED DOCUMENT SUMMARY

Once data collection and existing and future conditions analysis were complete, the *Purpose and Need Document* was created. This document focused the results of this analysis into a clear statement of the purpose and need for the project. A brief summary of the document is provided below.

The purpose of the Cleveland Innerbelt Study was to develop a strategy for the intelligent renewal of the transportation infrastructure. The infrastructure (bridge decks and roadway pavements) of the Innerbelt Freeway is approaching the end of its useful life. Absent of all of the other needs of the Innerbelt Freeway, there is a need to renew the infrastructure, to replace the bridge decks and rehabilitate the roadway pavements, within the anticipated renewal period of approximately 10 years.

- Innerbelt Freeway Infrastructure (Bridge Decks) – The Innerbelt Freeway's bridge decks are of similar age, construction and condition, and will all need to be replaced

within the anticipated renewal period. Of particular concern with respect to the bridge decks is that 24 of the Innerbelt Freeway's 25 bridges are concentrated within the 3-mile section of freeway that extends from the I-71 interchange with SR 176 through the I-90 interchange with I-77 (Central Interchange). This includes the 5,079-foot-long Central Viaduct Bridge, which carries eight lanes of I-90 over the Cuyahoga River Valley

- Innerbelt Freeway Infrastructure (Roadway Pavements) – The Innerbelt Freeway's roadway pavements are of similar age, construction and condition, and will all need to be rehabilitated within the anticipated renewal period.

Developing a strategy for the intelligent renewal of the transportation infrastructure requires more than an analysis of the physical condition of the bridge decks and roadway pavements. It requires an understanding of the functions that the Innerbelt Freeway serves and its relationship to the Innerbelt Corridor.

- Innerbelt Freeway Function – Access to and mobility through downtown Cleveland depends on the Innerbelt Freeway's ability to collect and distribute traffic between the radial freeway system and the local street system, as well as the Innerbelt Freeway's ability to interchange traffic between the radial freeways without using the local street system. The Innerbelt Corridor is comprised of the Innerbelt Freeway, together with portions of the radial freeways and portions of the local street system. The limits of the Innerbelt Corridor recognize the interrelationship between each of the components (Innerbelt Freeway, radial freeways, local streets).

Developing a strategy for the intelligent renewal of the transportation infrastructure also requires an analysis of how well the Innerbelt Freeway performs these functions, keeping in mind that the operational performance of the Innerbelt Freeway is affected by the operational performance of the radial freeways and the local street system. In turn, the operational performance of the Innerbelt Freeway affects the operational performance of the radial freeways and the local street system.

- Innerbelt Freeway Operational Performance – During the AM and PM peak periods, the travel demand exceeds the capacity on portions of the Innerbelt Freeway. This results in a reduction in running speed, the queuing of traffic on the mainline of the freeway and the diversion of traffic from the freeway to the local street system
- Innerbelt Freeway Safety – Portions of the Innerbelt Freeway experience crash at rates that exceed the average rate (1.2 crashes per million vehicle miles traveled) for other urban freeways within the region. Crash rates on the Innerbelt Freeway are generally two to three times greater than the regional average for interstate highways.

The term intelligent renewal refers not only to the restoration of the structural integrity of the bridge decks and roadway pavements, but also to the improvement of the safety and operational performance. The term intelligent renewal also reflects the recognition that while the function of the Innerbelt Freeway is to move traffic; the purpose of the Innerbelt Freeway is to serve the community. Thus, it is important to understand that the public expects the

Innerbelt Freeway to support community goals, enhance the aesthetics of the built environment, and reflect high standards of environmental responsibility.

Finally, developing a strategy for the intelligent renewal of the transportation infrastructure requires an understanding of the tremendous challenges associated with the renewal of urban interstate freeways. It requires recognition of the importance of the Innerbelt Freeway's role in providing for the safe and efficient movement of people, goods and materials to, from and through downtown Cleveland. It requires the development of a strategy that will:

- Maximize the service life of the facility
- Minimize the disruption caused by construction activities
- Minimize the frequency and scale of future maintenance activities.

Therefore, the Ohio Department of Transportation undertook the Cleveland Innerbelt Study to develop a strategy for the intelligent renewal of the transportation infrastructure. Specifically, the final product of the Cleveland Innerbelt Study was a comprehensive master plan that supports community goals, while:

- Improving the physical condition of the existing Innerbelt Freeway bridge decks and roadway pavements
- Improving operational performance of the Innerbelt Freeway
- Improving the safety of the Innerbelt Freeway
- Improving the access provided by the Innerbelt Freeway.

## 1.7 STUDY PROCESS AND HISTORY

This section of the report provides a general overview of the activities conducted as part of overall study. This is not meant to be a detailed account of all activities pursued as part of the study, but to provide a context for understanding the alternatives development and analysis and the overall study process. This overview is organized based on the first four planning steps of the ODOT Project Development Process for Major Projects.

### 1.7.1 Step 1 – Work with Stakeholders to Understand Problems, Needs, and Goals

With the authorization to proceed on August 18, 2000, the study team began Step 1 and Step 2 of the ODOT Project Development Process for Major Projects. The team worked through the first couple months to define the general study area, identify stakeholders, and develop the public involvement plan, in preparation for the first Cleveland Innerbelt Study Scoping Committee meeting, held on November 2, 2000. At this meeting, the fundamentals of the study were unveiled to the public. A primary concern during this early stage of the study was having the appropriate community stakeholders invited to be a part of the Scoping Committee. This was addressed during and even after the first Scoping Committee meeting.

Throughout the entire study, close coordination was maintained with all other concurrent studies that may have an impact on the Innerbelt Corridor and vice versa. These studies

included: Euclid Corridor Transportation Study, Eagle Avenue Viaduct Study (formally named the Flats Transportation Study) and the Cleveland Lakefront Study.

Throughout the study, key team members briefed the Cleveland City Council, Cleveland Planning Commission, Northeast Ohio Areawide Coordinating Agency (NOACA), Cuyahoga County Planning Commission, and Cuyahoga County Commissioners when requested.

Focus groups were also used to guide the study team through the public involvement process and the creation of the Public Involvement Plan. The focus groups were used to capture a sampling of attitudes and needs of the public in three specific categories: neighborhood residents, business and civic leaders, and commuters.

The study team developed a detailed project process flow chart. This flow chart outlined the critical tasks to be accomplished by the study and graphically showed their relationship to each other in the overall project scheme. This workflow was developed to correspond to the Five-Step Planning Process, the ODOT planning process at the time. This was later updated to reflect changes associated with Steps 1 through 4 of the current ODOT Fourteen-Step Project Development Process. The major areas generally covered by the workflow correspond to: Existing and Future Conditions, Alternative Concepts, Conceptual Alternatives, Hybrid Alternatives and Recommended Design Concept and Scope.

The project team conducted a Partnering Workshop on December 6, 2000 that involved key representatives from ODOT, the City of Cleveland, the Greater Cleveland Regional Transit Agency (GCRTA), FHWA, Cuyahoga County, and members of the consultant team. This team building session yielded a Mission Statement and draft set of goals for the study. The Mission Statement was revised and accepted by the Scoping Committee on January 4, 2001. From January through June 2001, the study team worked with the Scoping Committee at the monthly committee meetings and with smaller focus groups made up of Scoping Committee members to revise the draft Goals and Objectives in a workshop setting.

Over the course of the study, the team hosted thirteen general public meetings that coincided with important project milestones. Meetings were scheduled within the Study Corridor and served to inform the public of the project status and offer the opportunity to provide comments. All general public meetings were divided into two formats. During the open house portion of the meetings, display boards were used to communicate key project information with study team members available to answer one-on-one questions. During the town hall portion of the meeting, a formal presentation was given followed by an open question and answer period, facilitated by the study team.

The first large, general public meeting was held January 24, 2001 at Cleveland State University. The meeting was attended by over 250 residents and members of the media. The “You Plan It” station utilized in the open house portion of the meeting was useful in soliciting public suggestions for potential improvements to the roadway network. At this station attendees were asked to draw their solutions on the study area map while working with a facilitator from the study team. The ideas for the University Circle Access Boulevard,

University Circle Access Freeway, and Innerbelt Boulevard Alternative Concepts were a direct result of input garnered at this station.

From March 2001 through August 2001, the study team met with over 30 small community groups to present the draft Existing and Future Conditions and to obtain community feedback regarding their views of problems and opportunities within the corridor. This effort was supported by continued dissemination of information through both the project website and eight ***Innerbelt Access*** newsletters.

A project website was developed, www.innerbelt.org. This website was used as a storehouse of all relevant information regarding the project. All Scoping Committee presentations and minutes were posted on this site. Further, all relevant alternative descriptions were posted and a forum was provided for online users to give feedback regarding the alternatives or the study in general. All relevant project documents were also posted on this site.

The Alternative Concepts were unveiled to the general public on October 11, 2001 at the Greek Orthodox Church of Annunciation in Tremont. The initial ten Alternative Concepts were communicated in both open house and town hall formats at this meeting, which was attended by over 130 people. The refined Alternative Concepts were presented at a general public meeting on November 15, 2001 at Cleveland State University.

At the June 13, 2002 Scoping Committee meeting, the Scoping Committee formally adopted the consensus process. This process was used throughout the remainder of the study as a vehicle for the Scoping Committee to reach decisions.

A presentation covering the ODOT Sixteen-Step Project Development Process, which was later refined to the ODOT Fourteen-Step PDP, was given at the September 19, 2002 Scoping Committee meeting by the ODOT Office of Urban and Corridor Planning. As the PDP process matured, periodic updates were presented to the Scoping Committee so that they could understand the context under which decisions were being made and have an understanding of the overall process.

Between February 2002 and January 2003, a series of smaller meetings were held with smaller sub-committees formed by the City of Cleveland called Neighborhood Planning Committees. These committees worked to refine the performance measures, review travel demand modeling assumptions, and develop new alternative concepts.

The results of the detailed analysis of the eight Conceptual Alternatives were presented to the general public in a series of three meetings set in each major region of the study area. The first meeting was held on January 21, 2003 at the Greek Orthodox Church of the Annunciation in Tremont. The second was held on January 28, 2003 at the Cuyahoga Community College. The third was held on January 29, 2003 at the Slovenian National Home in the St. Clair-Superior neighborhood. Attendance to all three meetings totaled over 120 people.

The Hybrid Alternatives were unveiled in a series of three general public meetings: October 21, 2003 at the Greek Orthodox Church of the Annunciation in Tremont; October 23, 2003 at Quincy Place in the Fairfax-Renaissance neighborhood; and, October 29, 2003 at the Slovenian National Home in the St. Clair-Superior neighborhood. Combined attendance at these public meetings was approximately 90 people.

A special session of the Scoping Committee was held on February 5, 2004 at the request of several Scoping Committee members. This special session centered on a presentation of the ODOT PDP and the National Environmental Policy Act (NEPA) Processes and how they will be integrated into the next phase of the project.

At the February 12, 2004 meeting of the Scoping Committee consensus was reached to accept the Recommended Design Concept and Scope as presented to the committee. This acceptance was conditional on ODOT and the City of Cleveland completing an Interagency Agreement regarding the remaining phases of the project.

The final Scoping Committee meeting was held on June 10, 2004. At this meeting, a summary of the Strategic Plan was presented to the committee and certificates thanking the members for their participation were issued.

The final general public meeting for the study was held on June 16, 2004 at the Visiting Nurses Association near the Central Business District (CBD). At this meeting, the Recommended Design Concept and Scope and the Strategic Plan was communicated to the public in an open house format meeting. Approximately 80 people attended this meeting.

As a condition for achieving consensus on the Recommended Design Concept and Scope, ODOT and the City of Cleveland are in the process of negotiating an inter-agency agreement regarding the next phase of the project.

NOACA is the comprehensive regional agency for five counties - Cuyahoga, Geauga, Lake, Lorain, and Medina – in Northeast Ohio. As a federally designated Metropolitan Planning Organization (MPO), NOACA is responsible for cooperative and continuous planning for highways, public transit, and bikeways, as defined in the Transportation Equity Act for the 21st Century. It is also responsible for performing continuous water quality, transportation-related air quality, and other environmental planning functions. NOACA administers the area's clearinghouse function regarding federal funds targeted for projects benefiting the five Counties, offering local government an opportunity to review a wide variety of local or state applications. The Agency also conducts demographic, economic, and land use research as they relate to transportation and/or environmental planning, and serves as an important information clearinghouse regarding these extensive areas of research. NOACA, through its governing Board and related Committees, provides transportation and environmental assistance to 165 units of local, general- purpose government.

The Governing Board is responsible for approving a long range Transportation Plan for the region embodied in *The Framework For Action 2025*. The long-range plan was updated in 2002. One of NOACA's principle planning documents is the Transportation Improvement

Program (TIP), which works hand-in-glove with the long-range Transportation Plan. The TIP budgets, prioritizes and schedules the NOACA region's highway, bikeway and transit projects. The TIP, which has a four-year time frame, accounts for the region's immediate transportation system expenditures. NOACA updates the TIP every two years and the Governing Board may amend it quarterly.

In order for the projects recommended by the Cleveland Innerbelt Study to be advanced into the environmental, engineering and construction stages and be eligible for federal funding, they must be adopted by the NOACA Board as part of the long range plan and included in the TIP. Projects to be included in a TIP amendment must first go through a technical review by both the Board's Technical Advisory Committee (TAC), which advises and recommends actions to the Board, and then by the NOACA Board itself. Following the technical reviews, the projects are again reviewed by the TAC with an approval and a recommendation to the Board for amending the TIP for the projects. The NOACA Board then makes the decision of whether to amend the TIP by including the proposed Projects.

The Cleveland Innerbelt Study kept both the NOACA TAC and Board advised of the study progress throughout the course of the Study. In the Spring of 2004 the Study began the process of TAC and Board technical reviews followed by TAC and Board approvals. In addition, air quality analysis travel demand model runs were coordinated with NOACA. The projects must be evaluated for their impact on regional air quality to assure that the transportation plan will continue to conform to the state's Strategic Implementation Plan (SIP) to achieve USEPA clean air standards. This is an additional requirement for federal funding eligibility. This work led to a NOACA Board vote and approval on July 9, 2004, to place key segments of the Recommended Design Concept and Scope on the Transportation Improvement Program (TIP) and NOACA Long Range Plan. Projects included in the TIP include:

- East 55th Street Grade Separation
- Quigley Road Connector
- Innerbelt Curve
- Central Viaduct Bridge
- South Innerbelt Improvements
- Central Interchange I-90/I-77
- Downtown Innerbelt Trench
- Cuyahoga River Valley Intermodal Connector
- University Circle Access Boulevard.

### 1.7.2 Step 2 – Conduct Research and Technical Studies

Step 2 of the PDP for Major Projects also began during the autumn of 2000, with the inspection of the Central Viaduct Bridge. The scope of the inspection included the identification and documentation of all visible defects, selective testing to further define the bridge conditions, gathering of data for structural analysis of the bridge, and the filing of a formal report to ODOT with inspection findings and maintenance recommendations. Results were presented to the Scoping Committee during the January and March 2001 meetings.

A load rating was performed on the Central Viaduct Bridge truss using GTSTRUDL structural analysis software. It was determined that the truss members can carry all legal and permitted truck loads with strength to spare. The remaining fatigue life was determined to be infinite based upon the actual live load stress variations under normal traffic as field measured by strain gauges installed on the truss members. The west Cuyahoga River bank, Pier 1 and the west end pier movements were arrested with the completion of rehabilitation project 457(97) in October of 1999. Truss span 1 was adjusted south to open a closed expansion joint in span 2. Subsequent instrumentation and monitoring continue to show the slope to be stable.

The condition of all transportation infrastructure in the corridor was evaluated and compiled. This included the ratings of all bridges in the corridor and rating of the existing pavements. A workshop was held in June 2001 with key members of the study team, FHWA, and ODOT to focus on the bridge and roadway elements of the corridor. The useful lifespan of these elements was then determined. This information was used to develop the baseline alternative for the study, which outlined the minimum level of effort necessary to preserve the existing infrastructure.

The study team reviewed all relevant studies previously conducted or underway in the study area and summarized the findings of these studies in the Existing and Future Conditions Report. This information was used in the process of identifying potential alternatives and determining data needs. In addition, information regarding peer projects being conducted elsewhere in the country was collected to identify how similar projects are being addressed nationally.

The study team collected relevant transit information in the corridor (e.g. service levels, ridership, and load profiles). Further, the study team met with key staff from other relevant studies that were ongoing in the region to ensure that any alternatives developed were consistent with these parallel efforts and to coordinate any potential overlapping data collection efforts.

A crash analysis of the Innerbelt Corridor was completed by the study team to identify high-crash segments of the corridor. Further, a crash analysis was conducted on all major intersections in the study area and the top intersection crash locations were ranked. This information was then correlated with locations in the corridor that did not meet current design standards to determine problematic geometry in the corridor. The crash information was also correlated with the operational analysis to determine problematic congestion areas in the corridor. The locations that were identified as safety problems due to existing geometry and congestion were used to develop alternatives.

The Modeling Advisory Committee (MAC) was established, which was comprised of key representatives from ODOT, FHWA, GCRTA, City of Cleveland Traffic Division, NOACA, and consultant team members. This MAC was tasked with reviewing and approving all travel forecasting methodologies and results, traffic modeling methodologies and results, and all data input. This was an important step to ensuring that all key modeling decision makers

associated with this study were comfortable with the results and decisions made as part of the ongoing study.

An INTEGRATION model network for the study area was built and used to analyze existing and future operational conditions. CORSIM model networks of key segments of the Innerbelt were also constructed for the Central Interchange, Innerbelt Trench, and Innerbelt Curve segments. As part of this effort, traffic counts were taken at approximately 320 locations in the study area. Further, signal timing data was collected for approximately 50 key intersections in the study area. This data was used to calibrate and validate the INTEGRATION model. This validation was accepted by the MAC on October 15, 2002.

As part of the travel demand modeling effort, a parking allocation model was developed, as well as a revised three-purpose highway assignment procedure. In support of the parking allocation model, a parking inventory of the CBD was conducted and supported with a user's survey. Further, the study team worked with NOACA to refine the Traffic Analysis Zone (TAZ) structure for the study area. These new travel demand model components and procedures were accepted by the MAC on May 17, 2001.

At the direct request of the Scoping Committee, the study team worked with the City of Cleveland, local Community Development Corporations (CDC's) and NOACA to verify that all growth projections reflected in the year 2025 travel demand model were consistent with local development plans for the study area. Additional meetings were held to review these results and consensus was achieved that the travel demand model growth projections were adequately reflecting future development plans for the study area.

The collected data and analyses were used as the basis for developing the Problem Statement, Existing and Future Conditions Report, Red Flag Summary, and Draft Purpose and Need Statement.

A Notice of Intent was filed by the study team in June 2001. This Notice of Intent was published in the Federal Register on September 27, 2001.

Between July 2001 and December 2001 the study team worked with the Scoping Committee to develop performance measures for use in the evaluation of alternatives.

### 1.7.3 Step 3 – Identify and Evaluate Conceptual Alternative Solutions

The first Alternatives Workshop was held on June 11-12, 2001. ODOT staff and study team members worked collectively to outline issues and alternatives for the Innerbelt rehabilitation strategy. This workshop focused exclusively on the "No Build" or "Rehabilitation" Alternative, which considered the reconstruction/rehabilitation of the existing roadway/bridge system with no other changes. Issues addressed included: structural needs, alternative construction methodologies, advances in materials, maintenance of traffic/access, interim maintenance priorities, and community/environmental impacts to be considered.

The second Alternatives Workshop was held August 7-8, 2001. ODOT staff and study team members reviewed all existing and future condition data and conclusions regarding the transportation needs analysis. As a result of this workshop, ten initial Alternative Concepts were developed. These initial concepts were developed to address the problems outlined in the Draft Purpose and Need and Existing and Future Conditions Report. They represented multimodal alternatives that could be undertaken, individually or in concert with another alternative, to meet the needs of the corridor.

These ten initial Alternative Concepts were outlined to the Scoping Committee and the general public. In this phase of the process, the concepts were refined with the assistance of the Cleveland community. The study team held a series of meetings with the public to gather input and ideas to refine the concepts.

As part of this process, two brochures were developed which detailed the initial ten Alternative Concepts. These were distributed to the Scoping Committee and general public in October and November 2001. A series of planning charrettes were held with Scoping Committee members on October 11-12 and November 14-15 of 2001 to focus on refinement of the Alternative Concepts. Further, a traveling exhibit featuring the concepts was featured in several prominent study area locations, including Tower City, Cleveland City Hall and the Old Arcade.

Between November 2001 and January 2002, the study team developed criteria for evaluating all potential detour corridors to select primary and secondary maintenance of traffic corridors within the study area. This was the first step in the development of the preliminary maintenance of traffic/access plan. In addition, preliminary cost estimates were developed for all ten Alternative Concepts.

The study team began to analyze the initial Alternative Concepts in December 2001 through February 2002. A presentation of these results was made to the Scoping Committee in February 2002. As a result of the discussions held at that meeting, it was decided that the study team would work with several Neighborhood Planning Sub-Committees to develop additional alternative concepts.

The study area and corridor were reduced through creation of the Cleveland Lakefront Study. The Lakefront Study took responsibility for the Cleveland Memorial Shoreway (SR-2) from the Cuyahoga River to the interchange of I-90/SR-2 and I-90 east of the Innerbelt Curve. The Cleveland Innerbelt Study retained responsibility for the I-90/SR-2 interchange.

Members of the community met at the Kent State Urban Design Center in a session termed “Freeway Therapy.” At this session, they developed six new concepts which were brought forward to the Scoping Committee and requested to be incorporated into the analysis. As a result of this request, a series of workshops were held with Neighborhood Planning Committee representatives at the Kent State Urban Design Center in late April/early May to refine these concepts for potential inclusion in the study. The workshops resulted in the creation of two new Alternative Concepts—Neighborhood Planning Committee Alternative

Concept A and Neighborhood Planning Committee Alternative Concept B. This raised the number of Alternative Concepts being considered to 12.

On May 9, 2002, the Scoping Committee agreed with removal of the Collector-Distributor (C-D) Alternative Concept from further consideration based on a recommendation that came out of a concept review workshop that was held between the study team and the ODOT Office of Roadway Geometrics. The analysis performed in support of the workshop showed that using current design standards, the C-D Concept was not possible. All remaining concepts were geometrically feasible. At the July 11, 2002 Scoping Committee meeting, the Scoping Committee formally removed the C-D Concept from consideration through the consensus process.

After the remaining eleven Alternative Concepts had been analyzed to the same level of detail, the results were presented to the Scoping Committee on June 13, 2002. The initial analysis examined potential residential property takes, potential other (commercial, institutional, industrial) property takes, and estimated costs. Based on this analysis, three concepts were removed from further consideration: University Circle Access Freeway, Innerbelt Boulevard and Neighborhood Planning Committee Alternative Concept A. The Scoping Committee achieved consensus regarding these removals based on an order of magnitude differentials in the three areas examined. This decision resulted in eight concepts being advanced to the Conceptual Alternatives phase of the project for further development and analysis.

The individual components of the Intelligent Transportation System (ITS) Alternative were analyzed using the Intelligent Transportation Systems Deployment Analysis System (IDAS) between June 2002 and October 2002. The recommendations of this analysis were used to determine the ITS component of the Hybrid Alternatives and was passed on to the Freeway Management System (FMS) Study, which was running concurrently to the Innerbelt Study. Coordination meetings were held throughout the process between the two study teams.

At the December 2002 and January 2003 Scoping Committee meetings the regional and localized analysis results were presented, respectively. This information was also provided to the Scoping Committee in handout format so that the members could spend time considering the results in advance of the workshops to begin development of the Hybrid Alternatives.

As such, the study team met with the Scoping Committee in charrette format on February 4, 5, and 6, 2003 to discuss the results of the analysis of the eight Conceptual Alternatives. To facilitate dialogue during these charrettes, the attendees were grouped based on four categories: community/neighborhood development interests, neighborhood/business development interests, downtown/governmental interests, and environmental/institutional interests. The study team then worked with these smaller groups to begin the development of the four Hybrid Alternatives.

The Hybrid Alternatives were comprised of components that dealt with specific problems along the corridor. The four primary needs of the corridor were identified in the Purpose and Need document as: Physical Condition, Safety, Operational Performance, and Access. The

Hybrid Alternatives were developed to address these needs based on a range. At the minimum, the physical condition of the infrastructure needed to be fully addressed. At the maximum, all safety, operational and access issues were also addressed. Two intermediary solutions, the intermediate and advanced, were also developed which fully addressed the physical condition of the infrastructure, while only partially addressing the safety, operational and access needs.

The four Hybrid Alternatives were presented to the Scoping Committee on February 13, 2003.

Over the next year, the study team held numerous small group charrettes with stakeholders in key sections of the corridor. The results of these charrettes, as well as analysis, were used to help refine the components of the Hybrid Alternatives.

In the Hybrid Alternatives analysis, instead of looking at just the overall performance of a particular alternative, the individual performance of each of the components that made up the alternative were also considered. As such, the Recommended Design Concept and Scope was selected to be a combination of the best components of all Hybrid Alternatives, not just a single whole alternative.

The Recommended Design Concept and Scope was selected using the consensus decision-making process by the Scoping Committee on February 12, 2004.

### 1.7.4 Step 4 – Develop Strategic Plan

Based on constructability, safety, operational impacts, access impacts and potential available funding, a timetable for the delivery of the components of the Recommended Design Concept and Scope was developed. The Strategic Plan, represented by Chapter 3 of this report, provides a basic blueprint for implementation of the recommendations of the planning process. Individual components are discussed in detail, as well as a construction sequencing/phasing strategy, a basic project schedule, and funding scenarios for each component.

An Economic Impact Study was prepared. The study estimates the potential user cost savings accruing from the recommended improvements and direct economic impact to the local economy from construction. Regarding the University Circle Access Boulevard, Cuyahoga River Valley Intermodal Connector and Innerbelt Trench components of the Recommended Design Concept and Scope, the study estimates the potential impact these components will have on current development proposals under consideration in Cleveland. It is anticipated that this report will provide additional input to the environmental documents.

A Conceptual Maintenance of Access/Maintenance of Traffic Plan (MOA/MOT) was developed based on the project sequencing outlined in the strategic plan. This conceptual MOA/MOT plan built on the previous work done identifying suitable detour routes earlier in the study. Further, several workshops were held with representatives of ODOT, City of Cleveland and the consultant team to identify issues and discuss potential strategies. As a

result of this conceptual plan, several key locations on the secondary street system have been identified for potential upgrades in advance of implementation of a MOA/MOT strategy.

## 1.8 DECISION MAKING PROCESS

Before detailing the alternative development process and study decisions, it is important to present the format used to achieve consensus within the Scoping Committee. The decision making process of the Cleveland Innerbelt Study was a thorough and technical progression, guided by public involvement. With the formation of the Cleveland Innerbelt Study Scoping Committee in November of 2000, the study team strived to develop ***a strategy for the intelligent renewal of the transportation infrastructure*** that met the needs of the transportation system and the goals of the community.

The Scoping Committee utilized a consensus decision-making process as a vehicle for making decisions. This process was an open process in which all contributions were valued and participation was encouraged. The goal of this process was for it to be a cooperative and collaborative process that blended the knowledge, wisdom, and expertise of all participants into the best decision possible. Final consensus was only reached when all members of the Scoping Committee agreed that their major interests had been taken into consideration and addressed in a satisfactory manner and the resulting decision or consensus, represented the best choice available.

This consensus decision-making process was used in all phases of decision making on the study, including: Alternative Concept Phase, Conceptual Alternative Phase, Hybrid Alternative Phase and Recommended Design Concept and Scope Phase.

### 1.8.1 Consensus Decision Making Process

#### 1.8.1.1 Presentation and Clarification

Proposals were submitted in writing to the Scoping Committee members in advance of the meeting. The person submitting the proposal presented the proposal to the Scoping Committee. The presenter read the proposal as written, provided background information and stated the rationale supporting the recommendation. The Scoping Committee members limited initial questions and comments to those that sought a greater understanding of the proposal.

#### 1.8.1.2 Identification of Concerns

The Chairperson then asked each of the Scoping Committee members to identify any concerns they had related specifically to the proposal. Scoping Committee members were to refrain from making statements at that time that attempted to defend the proposal, immediately resolve any concerns or judge the value of any of the concerns expressed. Each of the concerns stated were recorded and posted. The concerns were then consolidated by grouping related concerns and eliminating duplicate concerns.

### 1.8.1.3 Resolution of Concerns

The Chairperson invited the Scoping Committee members to discuss each of the concerns, or groups of concerns, in an attempt to clarify and resolve. As concerns were resolved, they were checked off the posted list. Any unresolved concerns were then restated for clarification.

### 1.8.1.4 Call for Consensus:

The Chairperson asked the Scoping Committee members if there were any unresolved concerns; if none were voiced, then the Chairperson declared that consensus had been reached.

However, if unresolved concerns remained, then the proposal could be handled in one of three ways:

***Unresolved Concerns - Option 1***

*The proposal could be adopted with unresolved concerns*

The Chairperson could ask the person voicing concerns if he/she would be willing to "step aside" and allow the proposal to be adopted with unresolved concerns. If the person agreed, then the unresolved concerns were noted in the documentation of the decision. Unresolved concerns could be raised again at a later point in the process.

***Unresolved Concerns - Option 2***

*The proposal was not adopted*

If the person declined to "step aside", then the decision was "blocked" and the proposal was not adopted. Such proposals could be assigned to sub-committee, deferred or removed from consideration.

***Unresolved Concerns - Option 3***

*The proposal was referred to committee*

The Chairman could assign the proposal to a sub-committee, comprised of proponents and opponents of the proposal. The Chairperson could ask for volunteers to participate on the sub-committee. Persons with unresolved concerns were obligated to participate on the sub-committee. The sub-committee was responsible to review, discuss, clarify and develop a recommended resolution to the full Scoping Committee. The sub-committee's recommendation was forwarded to the full Scoping Committee prior to the next regularly scheduled meeting.

## 1.9 ALTERNATIVE CONCEPTS PHASE

The Alternative Concepts Phase of the study developed the initial set of 12 Alternative Concepts to be analyzed. These concepts included the 10 initial Alternative Concepts: Rehabilitation/Reconstruction Concept, Transit/HOV Concept, ITS/TSM Concept, Downtown Portal A Concept, Downtown Portal B Concept, Frontage Road Concept, Collector/Distributor Road Concept, University Circle Access Boulevard Concept, University Circle Access Freeway Concept, and Innerbelt Boulevard Concept. Further, two Alternative Concepts which were developed through working sessions with the Neighborhood Planning Committee were included: Neighborhood Planning Committee Realignment A and B. A brief description of each concept is given below.

### 1.9.1 Rehabilitation/Reconstruction Concept

Since the Innerbelt and Shoreway were built in the 1950s and 1960s, most of the bridges and pavements are in need of major reconstruction or rehabilitation. This concept outlines the minimum level of repairs needed to keep the system functioning over the next 20 to 40 years. They include: replacing original bridge decks; replacing existing pavement; adding a shoulder to the Central Viaduct; and, a solution to ease the conflict point at the Innerbelt Curve.

The needed bridge deck replacement includes decks along the Innerbelt, interchange bridges along I-71 and I-90, and decks along a portion of I-77. The Central Viaduct needs its stringer beams replaced in addition to its deck replacement. Further, additional maintenance and strengthening will be conducted to extend the life of the structure. In addition, much of the mainline pavement in the study area is in need of full-depth (i.e. from bare earth up) pavement replacement. Ramps and connecting roadway pavement will also need to be replaced/rehabilitated as appropriate and practical.

The Rehabilitation/Reconstruction (Figure 1-12) concept also addresses minimum safety improvements that need to be made in the corridor. The first of these safety improvements adds a breakdown shoulder to each side of the Central Viaduct. The second safety improvement improves the Innerbelt Curve. This includes flattening the curve, reconstructing the interchange with the Shoreway to accommodate changes made to the curve, and providing room for three westbound lanes on I-90.

### 1.9.2 Transit/HOV Concept

Expanded and new transit services are one alternative for improving mobility in the Innerbelt corridor. New and improved access to park and ride sites, improved transit service (bus and rail), and high-occupancy vehicle lanes for use by vans, taxis or personal automobiles with 2 or more riders and transit vehicles are components of the Transit/HOV alternative.

The Transit/HOV Alternative (Figure 1-13) includes new commuter rail service from Lorain to Downtown and Downtown to Aurora. A new dedicated busway using rail right of way from Aurora/Solon into downtown is also proposed. The Red Line would be improved

FIGURE 1-12:

# Rehabitlitation/Reconstruction

FIGURE 1-13:

# Transit/HOV Concept

considerably with increased frequency and park and ride expansion. Improvements to the Triskett and Puritas Station Park and Ride include the addition of median off-ramps that would drop motorists directly into the park and ride lot from the interstate would be made. Service to the southwest from downtown is also included in this alternative. Diesel Light Rail service is proposed from Tower City to Linwood using existing rail right-of-way in the vicinity of I-71.

The backbone of the transit service will continue to be bus transit. The bus transit components of this alternative proposed are quite extensive and focus on commuters.
plan calls for the addition of several park and ride locations to intercept drivers at convenient, highly accessible locations. The Westlake, Strongsville and North Olmstead Park and Ride facilities are proposed to be expanded. Signage to the Euclid Park and Ride facility is also proposed.

High Occupancy Vehicle lanes are also included as a component of this alternative. The HOV lanes would be signed for two or more occupants from all passenger vehicle types (taxi, personal automobile, or van), as well as for motorcycles. Buses would also be allowed in the HOV lanes. HOV facilities are proposed to serve the travel demand in the I-71, I-90, and I-77 corridors. Several alternative alignments are proposed to serve travel to downtown.

### 1.9.3 ITS/TSM Concept

The Intelligent Transportation System (ITS) concept (Figure 1-14) that is proposed for the Cleveland Metropolitan Area would include Freeway System elements and Surface Street elements that are integrated into a comprehensive Metropolitan Traffic Management System. The ITS would consist of:

- Sub-systems that collect real-time traffic and weather data from detection devices
- Automated traffic management capabilities such as coordinated signal control and ramp metering
- High Occupancy Vehicle (HOV) lanes control
- Freeway service patrols
- Ramp metering
- Variable speed limit signs
- Truck rollover warning signs
- Information dissemination to various types of users through Dynamic Message Signs (DMS) and Highway Advisory Radio (HAR)
- Traffic Management Center (TMC)
- Computer generated responses to a variety of traffic and transportation events
- Communications network to provide the link between ITS field elements.

### 1.9.4 Downtown Portal A Concept

This concept (Figure 1-15) seeks to improve traffic flow into and out of downtown by creating four major “Portal” or entry corridors into the downtown. Currently, most traffic wishing to access the downtown uses the Central Interchange. This concept would focus

FIGURE 1-14:

# ITS/TSM Concept

*(Intelligent Transportation System / Transportation Systems Management)*

FIGURE 1-15:

# Downtown Portal A Concept

some of this traffic to new Portals at Carnegie/Prospect, Superior, and a proposed Lakefront Boulevard. Further, minimal improvements would be made to the Central Interchange and improved signage would be used to redirect some traffic to the new Portals.

To make this concept work, a hierarchy of streets system would be created in the downtown area. This would create priority corridors within the downtown. These priority corridors would typically interface with the Portal locations, have improved cross-sections and have better signalization (both progression and priority over other streets) to improve their operation. As part of this priority corridor concept, boulevards would be developed along the Ontario/Woodland corridor, the Superior corridor, and the proposed Lakefront Boulevard corridor. They would be supplemented with a system of key major arterial roadways, including: East 9th Street, East 18th Street, Prospect (from the Innerbelt to the west), and Carnegie (from the Innerbelt to the east), which would revert to a two-way street.

There are currently four movements provided for as part of the Central Interchange: I-90 local traffic between I-90 and the local streets, I-77 local traffic between I-77 and the local streets, interstate system movements between I-77 and I-90 and local only movements between various local streets. As part of this concept, the I-77 local traffic movements would be relocated from the Central Interchange area to a reconstructed interchange at I-77 and Broadway/Orange. This will simplify the operation of the Central Interchange.

The existing Shoreway, from West 3rd Street to the Innerbelt, would become a boulevard roadway – the "Lakefront Boulevard." This boulevard would then extend across the Innerbelt and down East 40th Street to Superior Avenue, thus connecting the neighborhoods east of the Innerbelt to the lakefront area. Pedestrian and bikeway accommodations would be included. Connection points between downtown and the new Lakefront Boulevard would include West 3rd Street, East 9th Street, East 18th Street, and East 26th Street.

### 1.9.5 Downtown Portal B Concept

This concept (Figure 1-16) includes all of the components outlined as part of the Downtown Portal A Concept. However, it also includes three additional components: a complete reconstruction of the Central Interchange and a widening of the Innerbelt in the trench area.

The complete reconstruction of the Central Interchange as part of this concept will take the idea that was outlined in Downtown Portal A of separating movements in the interchange area to the next step. As before, the I-77 local traffic movements would be relocated from the Central Interchange area to a reconstructed interchange at I-77 and Broadway/Orange. Then, within the Central Interchange area, the system (I-90) and local movements would be separated from each other. Further, the local roadway system would be reconfigured to better address local only movements.

- Also included is a component that widens I-90 by one lane in each direction, for a total of eight lanes, in the trench area of the Innerbelt (from the Central Interchange to the Innerbelt Curve). This may be necessary to accommodate the additional traffic diverted to the new park

FIGURE 1-16:

# Downtown Portal B Concept

Portal roadways established at Carnegie/Prospect and Superior. This widening will be done within the existing highway right-of-way.

Other components include:

- Relocation of the collector-distributor roadways between Fulton Road and West 25th Street to the same grade as the mainline freeway and away from the adjacent neighborhood
- Reconstruction of the West 25th Street interchange to minimize amount of land used and possibly create free space for a potential
- Widening of I-71 in the Hospital Curve area by three lanes near the Jennings Freeway merge. The widening will be done within the existing highway right-of-way
- Widening the Central Viaduct Bridge to five lanes in each direction from the interchange of I-90/I-71/I-490 to the Central Interchange area
- Widening of I-77 by one lane in each direction inside the I-490 interchange
- Flattening the Innerbelt Curve
- Replacing the railroad bridge on East 55th Street south of I-90
- Creating a Flats Connector Boulevard to give better truck access to the flats area and remove truck traffic from the neighborhood.

### 1.9.6 Frontage Road System Concept

The Frontage Road System Concept (Figure 1-17) utilizes all components shown as part of Downtown Portal B with a few notable exceptions. First, the Innerbelt mainline would not be

widened in the trench area between the Carnegie Curve and the Innerbelt Curve. Instead, a frontage road system would be implemented in this area. Further, the Portals identified as part of the Downtown Portal B concept would be incorporated into this frontage road system as primary access points.

The Frontage Road System Concept also builds upon the idea of creating a hierarchy of streets system in the downtown area and the idea of priority corridors. As in the Portal concepts, direct access would be provided at each of the proposed portals in the trench area of the Innerbelt (Carnegie/Prospect and Superior). However, through the use of a frontage road system, indirect access would be provided to all other cross-streets between Carnegie and St. Clair via the frontage roads.

The frontage road system is proposed to run between Carnegie and St. Clair. These frontage roads operate as one-way street pairs that parallel the freeway at the same grade as the city street grid. The northbound one-way frontage road would be on the east side of the Innerbelt, while the southbound one-way frontage road would be on the west side of the Innerbelt. These proposed frontage roads would intersect each existing street along their length. Most of the needed frontage road construction would occur in existing highway right-of-way.

FIGURE 1-17:

# Frontage Road System Concept

CLEVELAND INNERBELT STUDY
OHIO DEPARTMENT OF TRANSPORTATION


## Components of Concept

1: Southern Innerbelt Improvements*
2: Flats Connector*
3: New River Crossing
4: I-77 Lane Balance (Additional Lane)
5: Widen Central Viaduct
6: Improve I-77/Woodland Avenue/ Orange Avenue Interchange
7: Upgrade Priority Corridors*
8: Reconstruct Central Interchange
9: Remove Existing Interchanges in I-90 Trench Area
10: Frontage Road System*
11: Downgrade Cleveland Memorial Shoreway to Lakefront Boulevard*
12: Increase Potential CBD Access to Lakefront Boulevard
13: Reconstruct I-90/Lakefront Boulevard Interchange
14: Reconstruct Innerbelt Curve
15: Reconstruct RR Bridge
16: Reconstruct C-D Roadways
17: Reconstruct West 25th Street Interchange (SPUI)*

*(For More Information, See Focus Board)

B&N URS TEAM

### 1.9.7 Collector-Distributor System Concept

The Collector-Distributor concept (Figure 1-18) focuses on preserving most of the existing access points in the trench area of the Innerbelt (Carnegie Curve to Innerbelt Curve). In other words, it maintains the existing downtown city street grid. To reduce the operational and safety impacts of these multiple access points along the Innerbelt, a collector-distributor (C-D) roadway system in the trench area is being considered.

Collector-distributor roadways run parallel to and at the same grade as the mainline freeway. The existing interchanges would be reconfigured to interface with these collector-distributor roadways. Thus, local traffic (i.e. those wishing to enter or exit the freeway) would be carried on the C-D roadways and through traffic would be carried on the mainline freeway. For example, if you were traveling east on I-90 toward the lakefront, as you approached the area of the Carnegie Curve area, you would have two options. First, if you wished to travel through the corridor to the proposed Lakefront Boulevard or points east, you would stay in the three mainline freeway lanes. Second, if you wished to exit the Innerbelt at say Chester, you would get on the two lane C-D roadway. You would travel along this C-D roadway to the Chester Avenue exit and exit as normal at that location. This widening of the Innerbelt would occur mainly in highway right-of-way.

Other components included in this concept include:

- A complete reconstruction of the Central Interchange area as explained in the Downtown Portal B concept
- The "down-grading" of the Shoreway to Lakefront Boulevard as explained in the Downtown Portal A concept
- The identification of East 9$^{th}$ Street and East 18$^{th}$ Street as priority corridors
- Widening of I-71 in the Hospital Curve area by three lanes near the Jennings Freeway merge. The widening will be done within the existing highway right-of-way
- Widening the Central Viaduct Bridge to five lanes in each direction from the interchange of I-90/I-71/I-490 to the Central Interchange area
- Widening of I-77 by one lane in each direction in the I-490 interchange
- Flattening the Innerbelt Curve
- Creating a Flats Connector Boulevard to give better truck access to the flats area and remove truck traffic from the neighborhood.

### 1.9.8 University Circle Access (UCA) Boulevard Concept

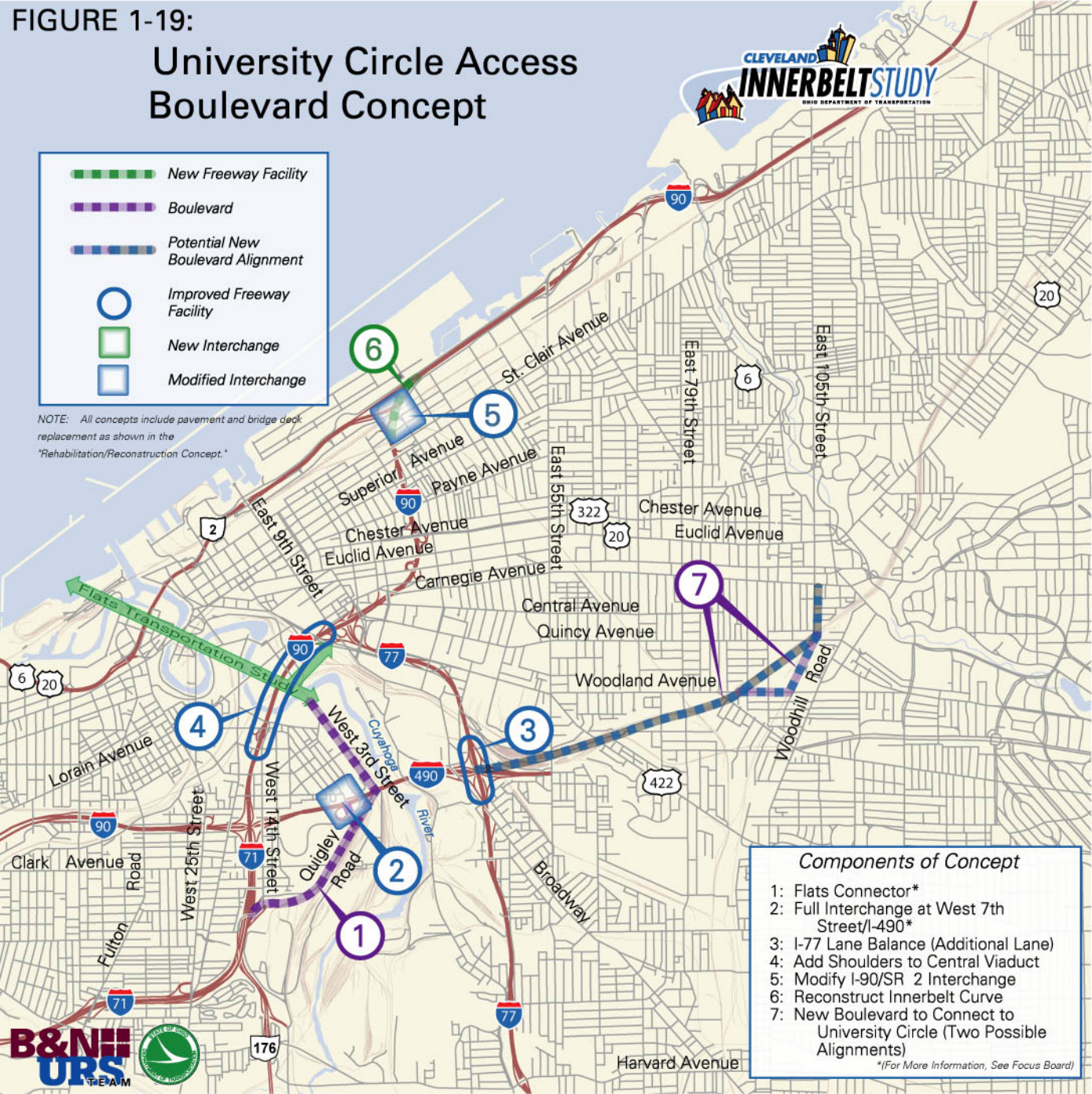
One of the major concerns that was raised as part of the initial public involvement that was done as part of this study was that there is no convenient access to University Circle from I 71, I-90, or I-77. Much of the traffic coming from these three routes currently utilizes the Innerbelt to access either Carnegie or Chester to, in turn, access the University Circle area. To address this, it was suggested that a four- or six-lane boulevard extending from the termini of I-490 out to the University Circle area be considered (Figure 1-19). The removal

FIGURE 1-18:

# Collector/Distributor Road System Concept

FIGURE 1-19:

# University Circle Access Boulevard Concept



of this University Circle traffic from the Innerbelt may improve operation and safety along that roadway. Two possible alignments for this boulevard were examined.

The first potential alignment utilizes existing railroad right-of-way. The UCA Boulevard will begin at the intersection of I-490/East 55th Street and extend east into the railroad right-of-way. To minimize neighborhood impacts, some realignment of I-490 is proposed just west of the existing I-490/East 55th Street intersection. The existing alignment of I-490 is displaced to the north to move the intersection of I-490/East 55th Street further north. This will require the relocation of an existing RTA facility, but will allow the UCA Boulevard to access the railroad right-of-way in a more direct fashion. The UCA Boulevard will then extend along this railroad right-of-way to East 105th Street near University Circle. It will then turn north and run up the East 105th Street corridor as far as Carnegie. Intersection access would be provided for all major cross-streets.

The second potential alignment begins at the existing intersection of I-490/East 55th Street. It runs up East 55th Street and connects to Woodland Avenue either through the existing intersection of East 55th Street/Woodland Avenue or via the Grand Avenue corridor. The UCA Boulevard then runs along the Woodland Avenue corridor to the railroad right-of-way. From there along the railroad right-of-way to East 105th Street where it turns north and follows the East 105th Street corridor as far as Carnegie Avenue.

Other components of this concept include:

- Widening the Central Viaduct Bridge to add breakdown shoulders to each direction from the interchange of I-90/I-71/I-490 to the Central Interchange area
- Widening of I-77 by one lane in each direction in the I-490 interchange
- Flattening the Innerbelt Curve
- Creating a Flats Connector Boulevard to give better truck access to the flats area and remove truck traffic from the neighborhood.

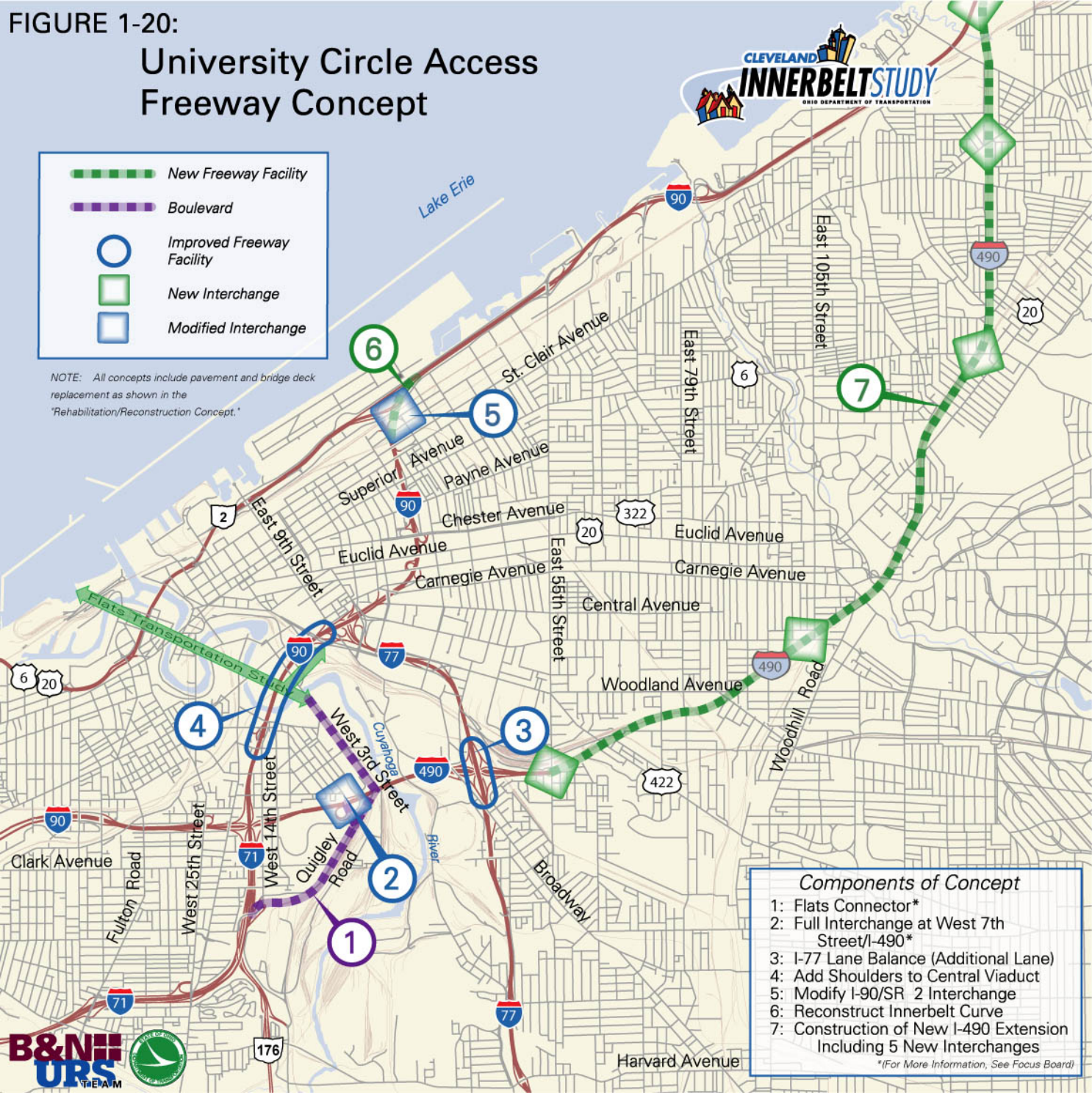
### 1.9.9 University Circle Access (UCA) Freeway Concept

This concept (Figure 1-20) takes the idea of removing University Circle traffic from the Innerbelt one step further by also looking at ways to remove through interstate traffic from the Innerbelt. This would be accomplished by creating a new interstate alignment along existing railroad right-of-way to provide for an east side by-pass of Cleveland.

This concept calls for extending I-490 from East 55th Street along Norfolk and Southern, CSX, and RTA rights-of-way to I-90/East Shoreway near East 133rd Street. The freeway would have limited access, with potential interchanges near East 55th Street, Kinsman Road, Buckeye Road/Woodland Avenue, Euclid Avenue near East 118th Street, Superior Avenue, and St. Clair Avenue at Woodworth Road.

FIGURE 1-20:

# University Circle Access Freeway Concept



Other components include:

- Widening the Central Viaduct Bridge to provide a breakdown shoulder in each direction from the interchange of I-90/I-71/I-490 to the Central Interchange area
- Widening of I-77 by one lane in each direction in the I-490 interchange
- Flattening the Innerbelt Curve
- Creating a Flats Connector Boulevard to give better truck access to the flats area and remove truck traffic from the neighborhood.

### 1.9.10 Boulevard Concept

This concept (Figure 1-21) builds on the ideas put forth by the University Circle Access Freeway concept. There was public sentiment that once interstate through movements were provided for via the UCA Freeway, the city center roadway network should be returned to the same character it had before the advent of the Interstate system. In other words, all highways north of the new UCA Freeway should revert back to city streets.

To facilitate this, a system of boulevards – with four, six, or eight lane cross-sections – and major arterials would be built to collect and distribute traffic to and from downtown Cleveland. An extensive system of these boulevards would form the backbone of the enhanced city street system and be supplemented by key major arterial streets. This new street system would be developed by downgrading the sections of I-90 and I-77 that have been redirected to the new freeway by-pass to boulevards and upgrading selected existing city streets. Thus, all traffic wishing to access the downtown area would disperse to this new system of boulevards and arterials. All interstate traffic would utilize the same alignment outlined as part of the UCA Freeway concept.

Other components include:

- Creating a Flats Connector Boulevard to give better truck access to the flats area and remove truck traffic from the neighborhood.

### 1.9.11 Neighborhood Planning Committee Realignment A Concept

This concept came out of a series of working sessions hosted by the Neighborhood Planning Committee. The Neighborhood Planning Committee (NPC) Realignment A Concept (Figure 1-22) seeks to remove the Innerbelt from the Tremont neighborhood as much as possible and relocate the Innerbelt alignment into the Industrial Valley. This new freeway alignment would begin at the hospital curve, where it would enter the Industrial Valley. This moves the interchange of I-90/I-71/I-490 to a location just east of the existing West 7th Street interchange and realigns the central interchange portion of the freeway down the current East 14th Street alignment. After the Interstate is relocated, the existing I-71/I-90 alignment between the hospital curve and Central Interchange is to be returned to a boulevard type roadway, with at-grade crossings—Tremont Boulevard. This new Tremont Boulevard would cross the Cuyahoga River on a new, high-level structure and terminate at the southern end of East 9th Street.

FIGURE 1-21:

# Innerbelt Boulevard Concept

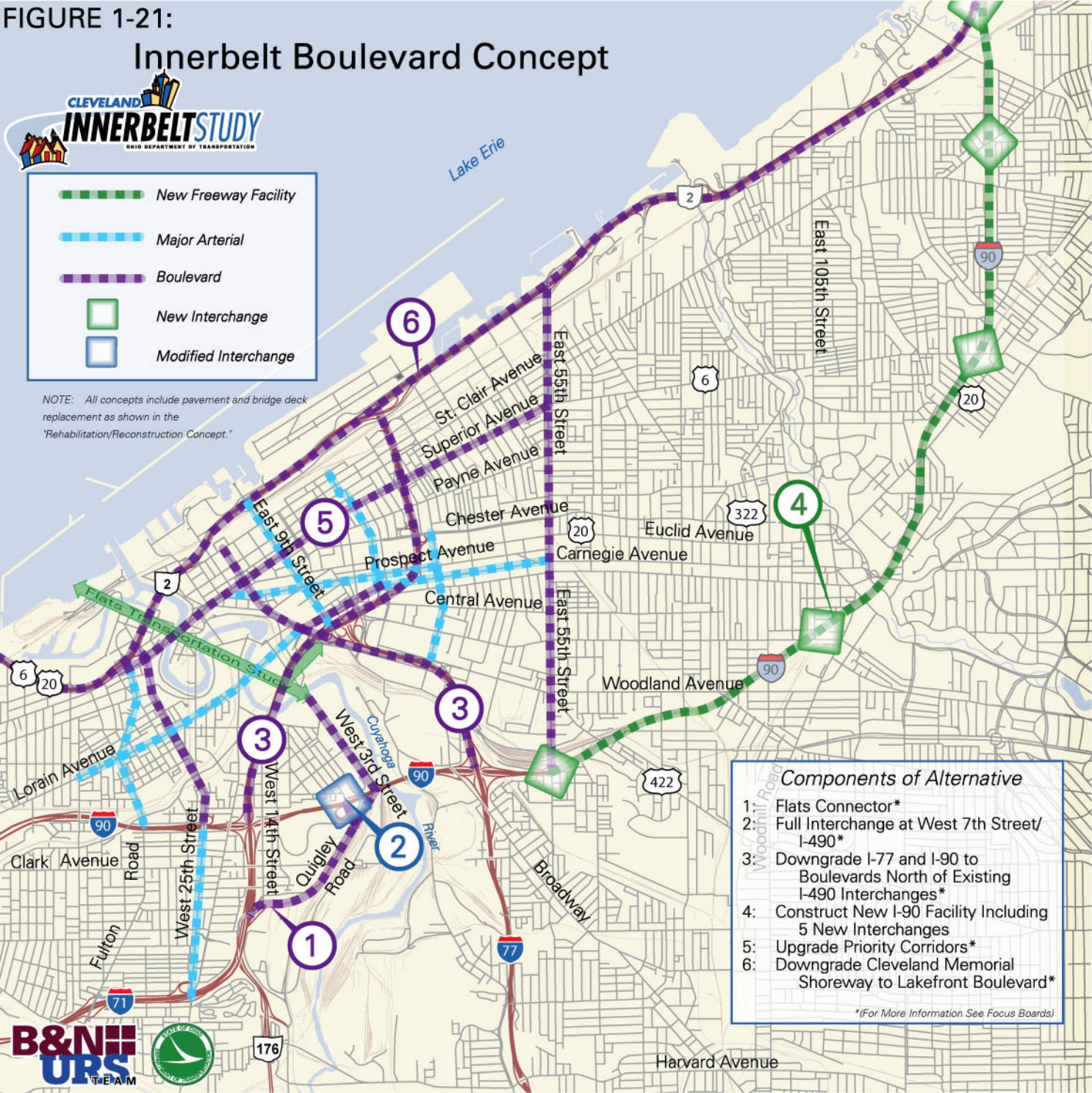


FIGURE 1-22:

# Neighborhood Planning Committee Realignment A Concept

In the downtown area, the NPC Realignment A Concept was paired with the frontage road treatment of the trench area. In addition to the frontage road system, a complete reconstruction and reconfiguration of the Central Interchange area will be undertaken to better and more safely serve the needs of the traveling public.

Other components include:

- Relocation of the collector-distributor roadways between Fulton Road and West 25th Street to the same grade as the mainline freeway and away from the adjacent neighborhood
- Reconstruction of the West 25th Street interchange to minimize amount of land used and possibly create free space for a potential park
- Widening of I-71 in the Hospital Curve area by three lanes near the Jennings Freeway merge. The widening will be done within the existing highway right-of-way
- Widening the Central Viaduct Bridge to five lanes in each direction from the interchange of I-90/I-71/I-490 to the Central Interchange area
- Widening of I-77 by one lane in each direction inside the I-490 interchange
- Flattening the Innerbelt Curve

- Replacing the railroad bridge on East 55th Street south of I-90
- Creating a Flats Connector Boulevard to give better truck access to the flats area and remove truck traffic from the neighborhood.

### 1.9.12 Neighborhood Planning Committee Realignment B Concept

This concept also came out of a series of working sessions hosted by the Neighborhood Planning Committee. The Neighborhood Planning Committee (NPC) Realignment B Concept (Figure 1-23) seeks to remove the Innerbelt from the Tremont neighborhood north of the existing interchange of I-71/I-90/I-490. The concept further removes I-77 north of the existing interchange of I-77/I-490. All Interstate traffic (I-71/I-90/I-77) is brought together on the east bank of the Industrial Valley. Traffic coming from I-90 and I-71 will utilize the existing I-490 high-level river crossing. Once across the Cuyahoga River, traffic from I-71 and I-90 will join traffic from I-77 on a single alignment over in the Industrial Valley. From there, the new Innerbelt will continue up the existing East 14th Street alignment and connect to the existing Innerbelt just south of the Carnegie Curve. No local connection is proposed in the Central Interchange area under this concept. Instead, access to the areas surrounding the existing Central Interchange would be made via either the new Tremont Boulevard (which is the downgraded section of existing I-71/I-90 between approximately Clark Avenue and Central Interchange) or via a combination of the new I-77 Boulevard (which is the downgraded section of existing I-77 between I-490 and the Central Interchange) and Broadway/Woodland Boulevard.

The existing I-90 alignment north of I-490 and the existing I-77 alignment north of I-490 are proposed to be returned to a boulevard type roadway, with at-grade crossings. The new Tremont Boulevard would cross the Cuyahoga River on a new, high-level structure and terminate at the southern end of Ontario. The new I-77 Boulevard would terminate at the

FIGURE 1-23:

# Neighborhood Planning Committee Realignment B Concept

proposed Broadway/Woodland Boulevard. The Broadway/Woodland Boulevard would be realigned to connect directly to the south end of East 9th Street.

In the downtown area, the NPC Realignment B Concept was paired with the Downtown Portal A treatment of the trench area. This concept addresses traffic flow issues developing three major Portal corridors into the CBD. These new CBD Portals will act as "Gateways" to the city and will be located at Carnegie/Prospect, Superior and a proposed Lakefront Boulevard. The new interchanges proposed for these locations will be able to accommodate high traffic demand and will orient drivers clearly toward the CBD.

Other components include:

- Relocation of the collector-distributor roadways between Fulton Road and West 25th Street to the same grade as the mainline freeway and away from the adjacent neighborhood
- Reconstruction of the West 25th Street interchange to minimize amount of land used and possibly create free space for a potential park
- Widening of I-71 in the Hospital Curve area by three lanes near the Jennings Freeway merge. The widening will be done within the existing highway right-of-way
- Widening the Central Viaduct Bridge to five lanes in each direction from the interchange of I-90/I-71/I-490 to the Central Interchange area
- Widening of I-77 by one lane in each direction inside the I-490 interchange
- Flattening the Innerbelt Curve
- Replacing the railroad bridge on East 55th Street south of I-90
- Creating a Flats Connector Boulevard to give better truck access to the flats area and remove truck traffic from the neighborhood.

### 1.9.13 Alternative Concept Decision Basis

The Scoping Committee considered three primary factors for selection of Conceptual Alternatives: estimated potential residential property takes, estimated potential other property takes (commercial, retail, light industrial, institutional, etc.) and cost. These factors were examined for order of magnitude differences. As can be seen from Tables 1.6-1.7 and Graphs 1-1 - 1-3, the UCA Freeway, Innerbelt Boulevard and NPC Realignment A Concepts had an order of magnitude difference when estimated potential residential property takes were considered. The UCA Freeway, Innerbelt Boulevard and NPC Realignment B Concepts had a higher projected potential other property takes. Finally, when considering cost, there was an order of magnitude difference for the UCA Freeway, Innerbelt Boulevard, and NPC Realignment A and B Concepts.

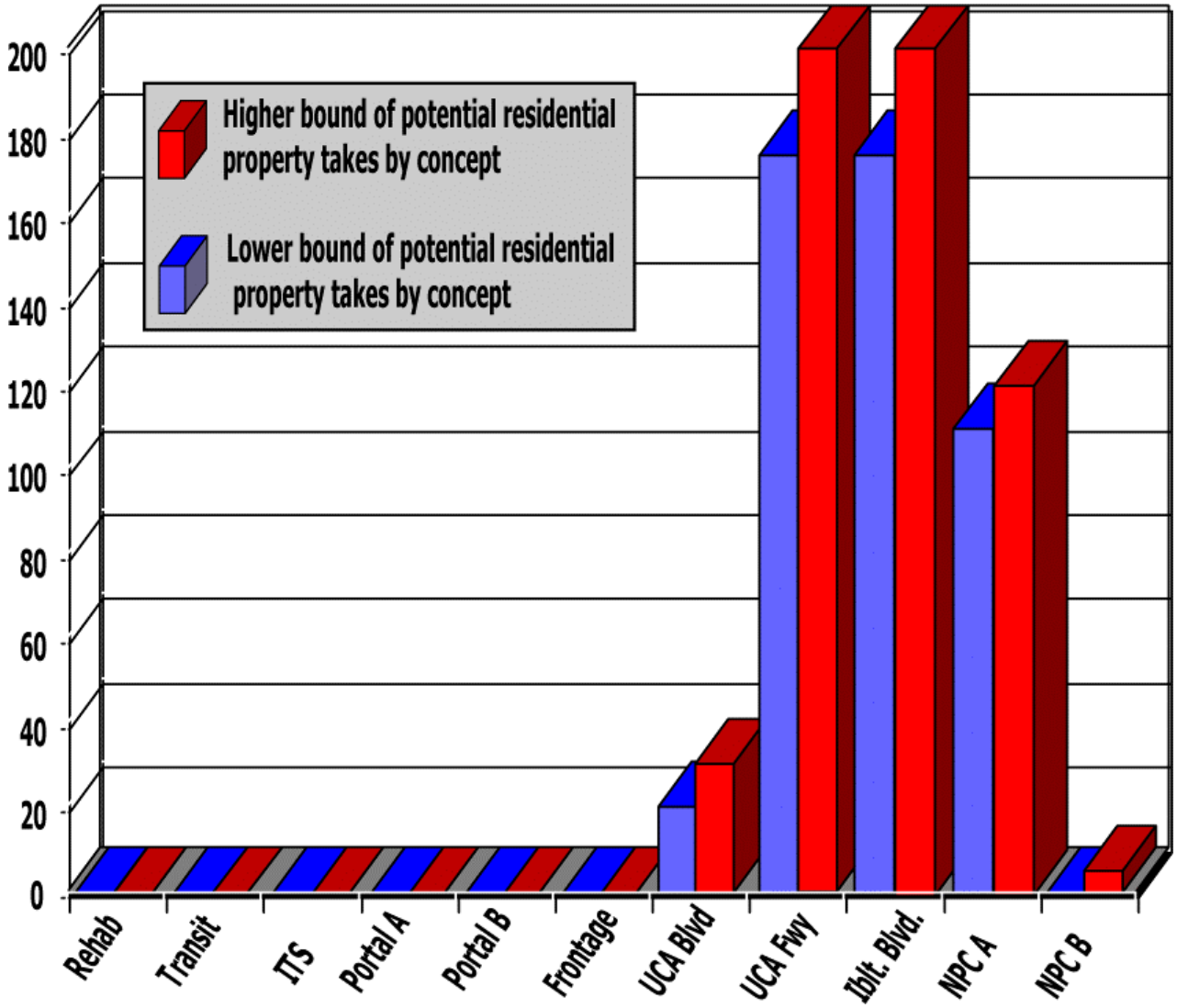
**Table 1.6 Estimated Potential Property Takes by Concept**

| *Concept* | *Estimated Property Takes* | |
|---|---|---|
| | *Residential Units* | *Other* |
| **Rehabilitation/Reconstruction** | **0** | **0-5** |
| **Transit/HOV** | **0** | **0-5** |
| **ITS/TSM** | **0** | **0-5** |
| **Portal A** | **0** | **10-20** |
| **Portal B** | **0** | **10-20** |
| **Frontage Road** | **0** | **10-20** |
| **UCA Boulevard** | **20-30** | **10-20** |
| **UCA Freeway** | **175-200** | **50-60** |
| **Innerbelt Boulevard** | **175-200** | **50-60** |
| **NPC Realignment A** | **110-120** | **20-30** |
| **NPC Realignment B** | **0-5** | **50-60** |

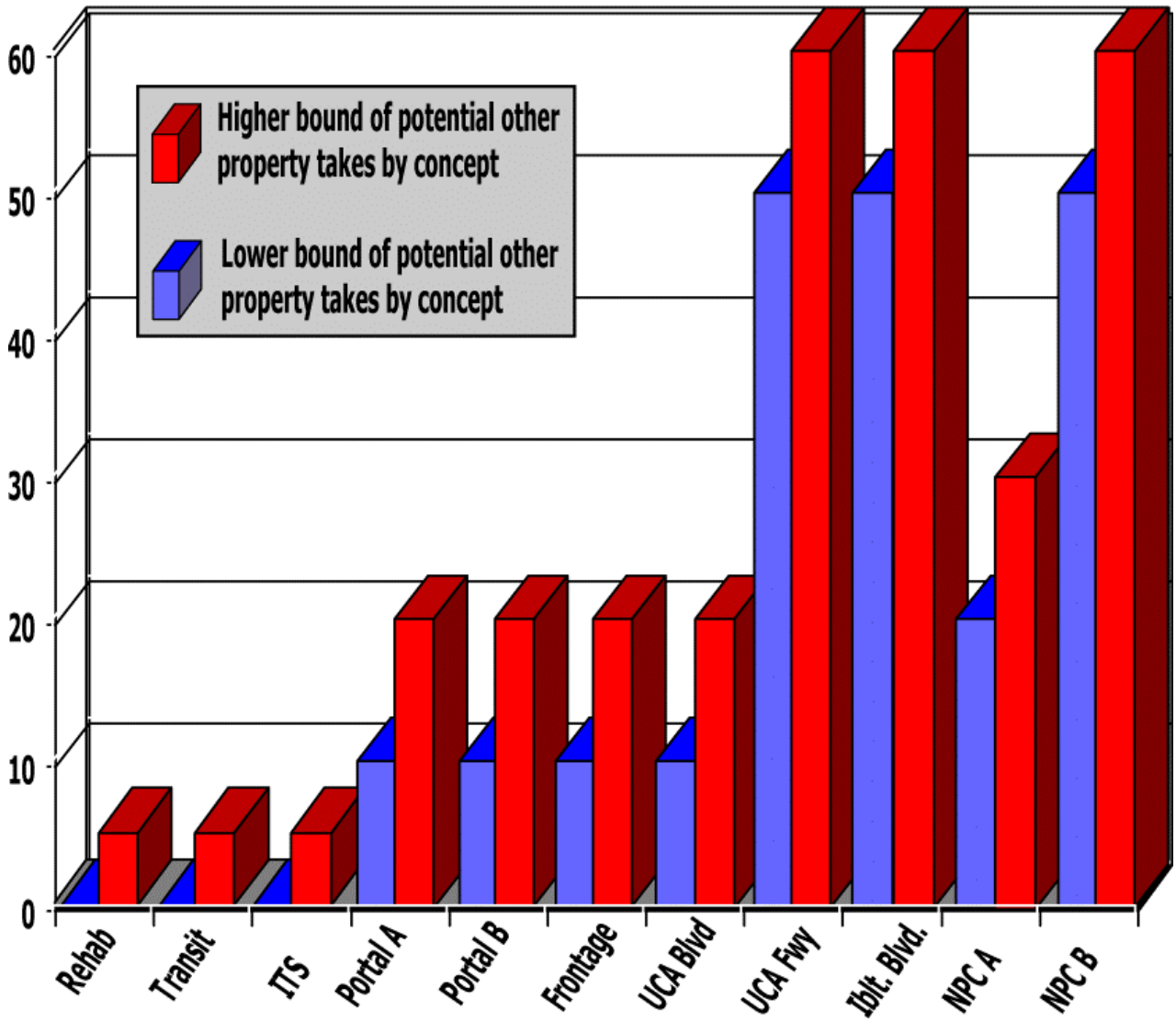
**Table 1-7: Estimated Cost by Concept**

| *Concept* | *Cost in Millions of Year 2002 $* | |
|---|---|---|
| | *Begin Range* | *End Range* |
| ***Rehabilitation/Reconstruction*** | ***$395*** | ***$415*** |
| ***Transit/HOV*** | ***$584*** | ***$973*** |
| ***ITS/TSM*** | ***$426*** | ***$448*** |
| ***Portal A*** | ***$734*** | ***$809*** |
| ***Portal B*** | ***$777*** | ***$864*** |
| ***Frontage Road*** | ***$805*** | ***$895*** |
| ***UCA Boulevard*** | ***$581*** | ***$635*** |
| ***UCA Freeway*** | ***$1,095*** | ***$1,452*** |
| ***Innerbelt Boulevard*** | ***$1,444*** | ***$1,851*** |
| ***NPC Realignment A*** | ***$1,440*** | ***$1,845*** |
| ***NPC Realignment B*** | ***$1,113*** | ***$1,367*** |

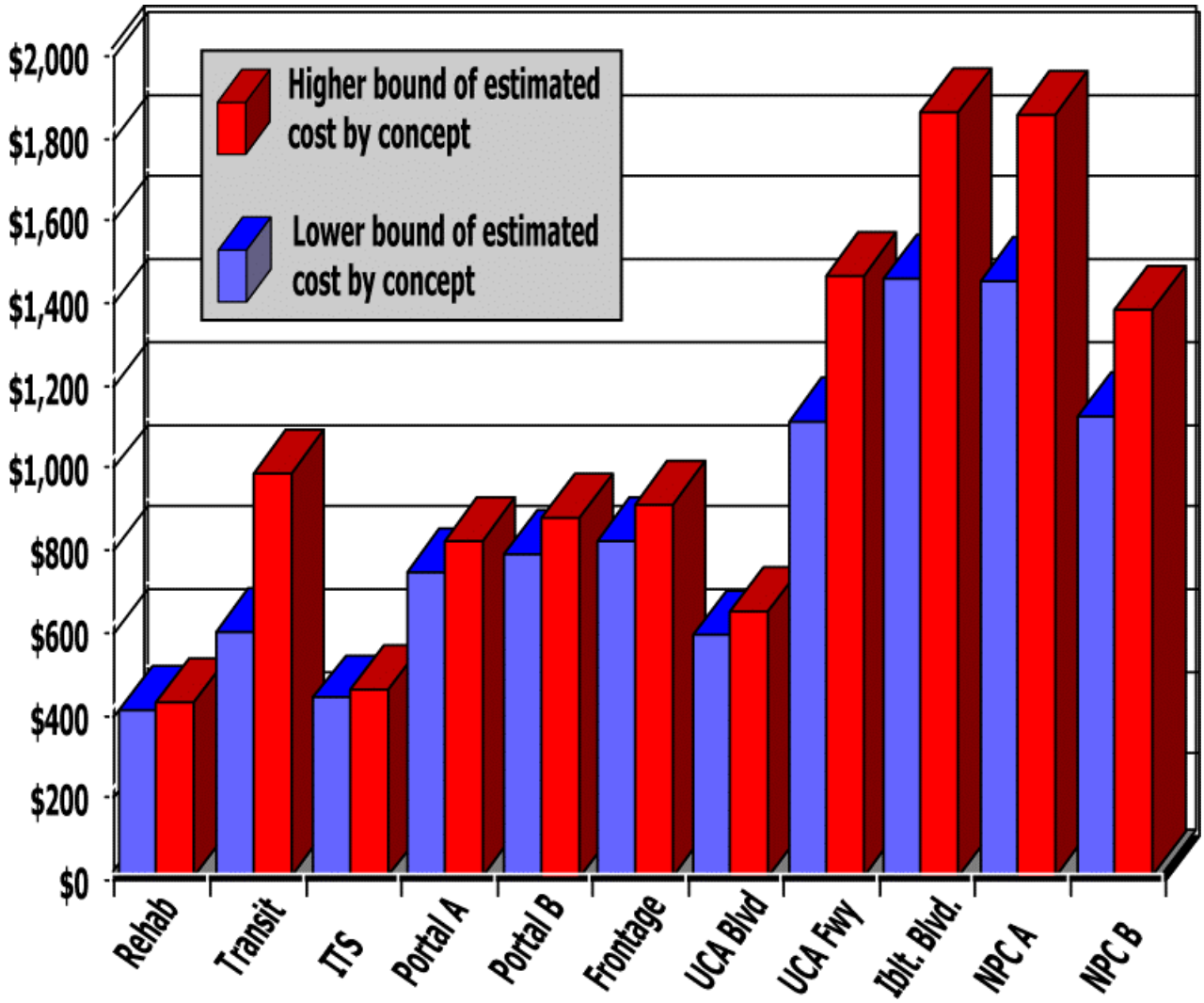
**Graph 1-1 Estimated Potential Residential Dwelling Unit Takes by Concept**



**Graph 1-2: Estimated Potential Other Property Takes by Concept**



**Graph 1-3 Estimated Cost by Concept**




The Scoping Committee considered the impact of these factors and determined that the UCA Freeway, Innerbelt Boulevard and NPC Realignment A Concepts should not be advanced as Conceptual Alternatives.

## 1.10 CONCEPTUAL ALTERNATIVES PHASE

The 8 Conceptual Alternatives selected for further study were presented in a Conceptual Alternatives booklet that was released to the Scoping Committee in July 2002.

Working with the Scoping Committee, a series of performance measures were developed for analysis of the Conceptual Alternatives. These performance measures were broken down into two general categories: regional/corridor and local. While the number of performance measures examined was extensive, this discussion will focus on those performance measures that are either important indicators or resulted in a large differential between alternatives.

At the regional/corridor level, the performance measures examined were generally grouped into the following categories: regional mobility, safety, downtown accessibility, level of service, physical environment, freight movement, transit impacts, HOV/ITS impacts and cost effectiveness. The local level performance measures were generally grouped as either neighborhood impacts or social environment.

When regional mobility was considered, none of the alternatives had an adverse impact on Vehicle Mile of Travel (VMT), Vehicle Hours of Delay (VHD), Vehicle Hours of Travel (VHT), average work trip during rush hour or average non-work trip during the off-peak hour.

As a surrogate measure for safety, the number of existing geometric deficiencies addressed by a particular alternative was examined. Four of the eight alternatives addressed an order of magnitude more geometric deficiencies, including: Downtown Portal A (25 deficiencies eliminated), Downtown Portal B (33 deficiencies eliminated), Frontage Road System (32 deficiencies eliminated) and NPC Realignment B (30 deficiencies eliminated).

With regard to downtown accessibility, none of the alternatives had a large negative impact on Innerbelt travel times within the corridor, on commute times to the CBD or on travel times to employment centers.

With regard to physical environment, none of the alternatives had an adverse impact on air quality with regards to HC, CO, NOx, or PM10. Further, none of the alternatives resulted in a large increase in the amount of lanes miles of impermeable surface, which was used as a surrogate for potential for adverse impacts on water quality.

The NPC Realignment B Alternative resulted in adverse impacts to freight movements in the corridor. Corridor Daily Truck VHT increased by 7 percent over the baseline alternative, average travel time between the Flats and the nearest freeway ramp increased by 35 percent and average travel time between the Industrial Valley and the nearest freeway ramp increased by 118 percent.

The NPC Realignment B Alternative also resulted in a reduction in lane miles servicing the CBD area. While freeway lane miles were reduced by 34 miles, non-freeway lane miles were only increased by 11 miles. This resulted in a net reduction of transportation infrastructure by 23 miles. This is further exacerbated by a reduction in freeway cross-section servicing the CBD. There are 11 freeway lanes entering into the corridor from the south and west—3 incoming lanes from I-90, 3 incoming lanes from I-71, 2 incoming lanes from SR-176 and 3 incoming lanes from I-77. Under this configuration, these 11 entry lanes must be serviced by 5 freeway lanes and 6 new arterial lanes. This loss of transportation infrastructure results in both the freeway and local street grid becoming overwhelmed in the peak periods. In the AM peak hour, the mainline freeway fails completely and all arterials feeding the CBD from the south and west fail. In the PM peak hour, the mainline freeway feeding the realignment fails and all arterials feeding or by-passing the realignment fail. However, there is not sufficient room to increase the cross-section of the mainline freeway along the realignment to add

capacity. Because of these critical failures the NPC Realignment B Alternative was not considered for advancement.

Operational problems also plagued several of the other alternatives considered. The Downtown Portal A and B Alternatives analyses showed that the proposed Prospect/Carnegie Portal was unable to handle the traffic demand in either the AM or PM peak hour.

Several of the alternatives had a large impact on reducing cut-through traffic along West 14th Street in the Tremont neighborhood. On an average, incident free day, approximately 1100 vehicles cut-through this neighborhood to avoid backups on the mainline freeway. Downtown Portal A Alternative reduced this cut-through traffic by 24 percent, while Downtown Portal B Alternative reduced it by 18 percent, Frontage Road System Alternative by 35 percent and University Circle Access Boulevard Alternative by 26 percent. Further, Downtown Portal A, Frontage Road System and University Circle Access Boulevard Alternatives resulted in a decrease in truck traffic in the Tremont Neighborhood. Any further reduction of truck traffic in the neighborhood would require strict truck restrictions.

The impacts of several of the components that make up the Conceptual Alternatives resulted in their not being considered for advancement into the Hybrid Alternatives Phase. The suggested reconfiguration of the existing interchange at I-71/West 25th Street to a SPUI was dropped from further consideration due to potential property impacts, no large geometric deficiencies with the current interchange, no existing crash problem, inability to provide access to land that is opened up by reconfiguration and removal of Scranton Road access.

The trench component of both Downtown Portal A and B Alternatives were removed from further consideration due to a failure of the Prospect/Carnegie Portal in both simulations. Without a viable interchange at that location, access in the trench area was restricted to Superior in Downtown Portal A and Superior and Chester in Downtown Portal B. Superior Avenue interchange was unable to handle the increased traffic in isolation and the Chester Avenue on-ramp to WB I-90 was too close to the SB I-77 diverge resulting in a failed weave movement.

Throughout the conceptual alternatives phase, several multi-modal or TSM components were considered as part of the analysis. By and large, these components were shown to not be effective. The Purpose and Need clearly shows that the primary problems in the corridor are related to congestion caused by poor interchange geometry and insufficient ramp spacing and the resultant safety problems associated with these deficiencies. It further demonstrates that the problem is not due to mainline capacity issues. Since the Cleveland CBD is currently serviced by high levels of both fixed guideway transit and bus service, increase in that service was shown to not be effective.

Several configurations of dedicated HOV and shared use HOV facilities were considered during this phase of the study. None of the alternatives considered had a major impact on bus ridership and none had any real congestion impact in the peak hour as measured in vehicle hours of delay. This was not surprising, as the HOV facilities considered were queue by-pass type facilities and the overall time savings from these facilities in the corridor was too small

to result in a mode shift. Thus, HOV facilities were not considered as a potential component of any of the Hybrid Alternatives.

An IDAS analysis of the proposed ITS component was completed. This was the only component of the TSM alternative that was shown to be effective. Since mainline capacity is not a problem along the corridor and since projected growth in the corridor is modest, most TSM applications were not shown to be effective. The ability of ITS to help manage incidents at key access points was determined to be a critical element of consolidating access points along the corridor. This analysis showed that ramp metering was ineffectual in the study area due to the inability to provide sufficient storage length on existing ramps resulting in congestion problems on the arterial street network and inability to provide sufficient acceleration distance resulting in a decrease in safety in the corridor. Thus, the ramp metering module of the ITS component was removed from further consideration.

## 1.11 HYBRID ALTERNATIVES PHASE

The components of the 8 Conceptual Alternatives were arranged into four Hybrid Alternatives: Minimum, Intermediate, Advanced and Maximum Hybrid Alternatives. These four hybrids progressively addressed more of the four primary needs outlined in the Purpose and Need document (physical condition, safety, operation and access). The details of these alternatives were presented in a Hybrid Alternatives booklet that was released to the Scoping Committee in June 2003. A brief description of each Hybrid Alternative is presented here, as a detailed description of many of the components can be found in Chapter 2, which details the Recommended Design Concept and Scope.

### 1.11.1 Minimum Hybrid Alternative

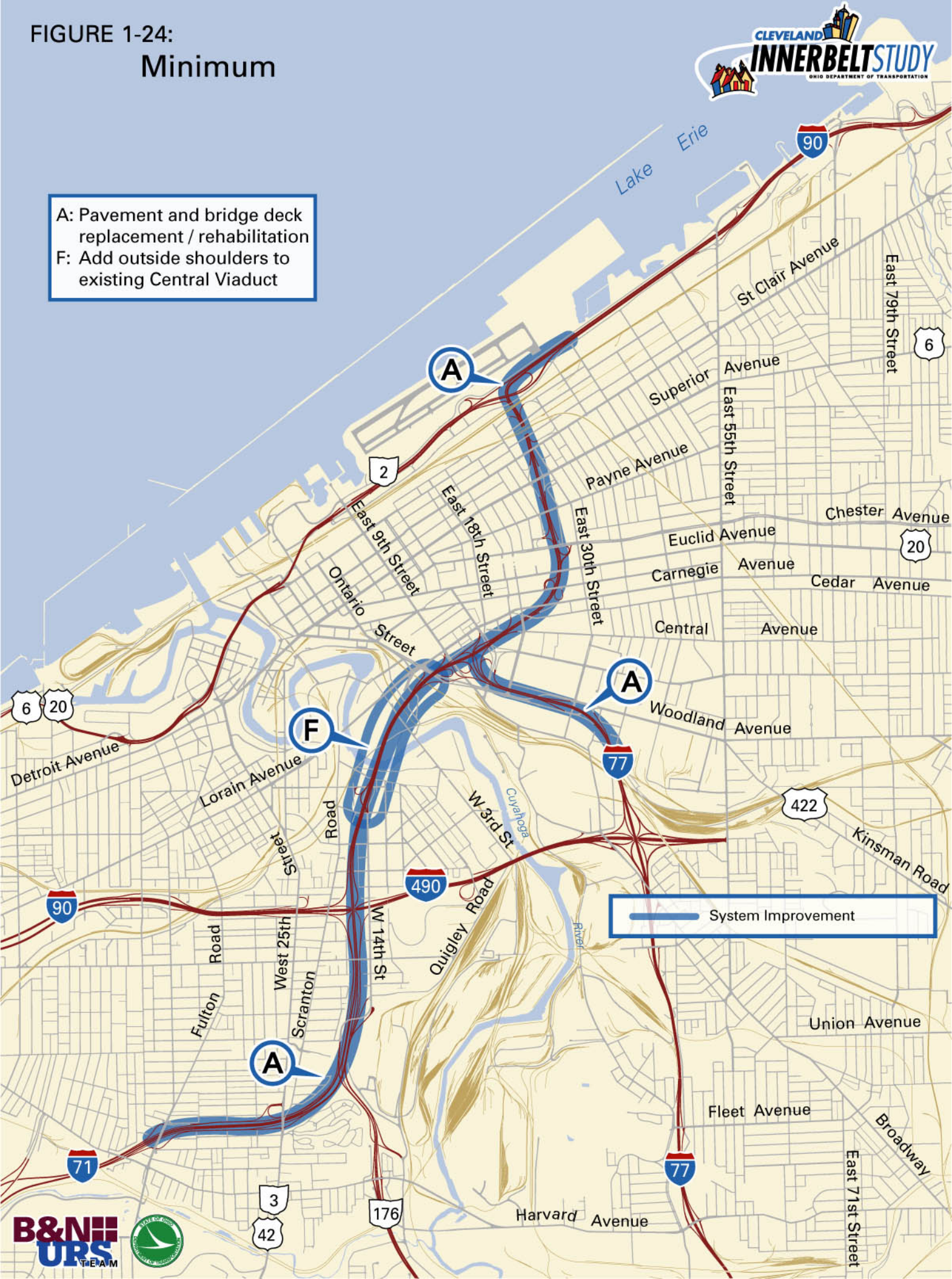
The Minimum Hybrid Alternative (Figure 1-24) serves as the "baseline" option in that, because of the condition of the pavements and bridges in the Innerbelt Corridor, it is the minimum amount of work required to keep the system functioning over the next 50 years. This alternative does not add any capacity, such as additional lanes, but it does add some safety improvements to the system. This is accomplished by adding breakdown shoulders to the Central Viaduct.

The following summary highlights the essential elements of the work, within each major freeway segment, that would be required for this alternative.

***Pavement and Bridge Deck Replacement/Rehabilitation***

- I-71 mainline pavement replacement/rehabilitation from the Fulton Road interchange north to the south end of the Central Viaduct
- I-90 mainline pavement replacement/rehabilitation from the north end of the Central Viaduct to just east of the Innerbelt Curve, located at the Cleveland Memorial Shoreway interchange
- I-77 mainline pavement replacement/rehabilitation from the Kingsbury Run Bridge to the Central Interchange
- Ramp and connecting roadway pavements replacement/rehabilitation

FIGURE 1-24:
Minimum



- All of the remaining original bridge decks along the Innerbelt mainline and the interchange bridges within the corridor need to have their decks replaced within the renewal time frame.

***Add Outside Shoulders to Existing Central Viaduct***

- Truss spans – replace deck and stringer beams
- Plate girder approach spans – replace deck on the west span and remaining original deck on east span
- As part of the truss and approach work, widen the structure to provide 10 foot outside shoulders
- Additional maintenance, preventive maintenance, and strengthening items, as needed, to extend life of structure
- The use of alternative construction methods (e.g. cast-in-place, pre-constructed units) will be evaluated through benefit/cost analyses.

### 1.11.2 Intermediate Hybrid Alternative

The Intermediate Hybrid Alternative (Figure 1-25) represents the next, higher level of investment for improving the Innerbelt Corridor. This alternative serves as the "bottleneck relief" alternative for the reason that it addresses the four primary bottlenecks within the system, in addition to replacing/rehabilitating the Innerbelt Corridor's bridge decks and roadway pavements, as described in the Minimum Hybrid Alternative. The bottlenecks addressed are as follows:

- I-71 northbound lane reduction from three to two lanes through the Metro Health Curve
- I-71 and Jennings Freeway (SR 176) merge
- I-90 at the Central Interchange
- I-90 at the Innerbelt Curve.

The Intermediate Hybrid Alternative adds capacity and improves safety through the construction of additional lanes in sections of the Innerbelt Corridor and the flattening of the Innerbelt Curve.

The problems and challenges associated with each bottleneck have different characteristics and, thus, different approaches. As such, each proposed bottleneck solution is addressed independently.

***Bottleneck 1: I-71 northbound through the Metro Health Curve and Bottleneck 2: I-71 and Jennings Freeway merge***

To eliminate these two bottlenecks, I-71 northbound will be widened to three lanes in the area of the Jennings Freeway merge. This widening of I-71 will be accomplished within the existing highway right-of-way. The widened three lanes from I-71 and the two lanes from I-90 will then continue to act as an add-lane configuration, requiring a widening of the Central Viaduct to five eastbound lanes.

FIGURE 1-25:

# Intermediate

CLEVELAND INNERBELT STUDY
OHIO DEPARTMENT OF TRANSPORTATION

A: Pavement and bridge deck replacement / rehabilitation (not shown)
C: Southern Innerbelt Improvements
$G_1$: Widen Central Viaduct to 10 travel lanes
J: Minor modifications to Central Interchange
N: Flattened Innerbelt Curve
O: New system interchange with Cleveland Memorial Shoreway


B&N URS TEAM

***Bottleneck 3: I-90 at the Central Interchange***

A minor reconfiguration and consolidation of access for the Central Interchange area is developed in this alternative to begin to address the problems associated with the Central Interchange bottleneck. In the eastbound direction, the five travel lanes coming across the Central Viaduct is reduced to four lanes through a drop-lane exit to Ontario Street. The cross section then narrows to three lanes through a drop-lane exit to East 9th Street. The East 22nd Street exit ramp is removed to eliminate the short weave between the I-77 entrance and the East 22nd Street exit. The I-77 northbound entrance would continue to enter as a merge. This three-lane cross section is then carried into and through the trench section (Carnegie Curve through Innerbelt Curve) of the Innerbelt. In the westbound direction, the existing three lanes coming out of the trench section increases to four lanes with an add-lane entrance from East 9th Street. The freeway is widened again to five lanes, with another add-lane from the Ontario Street entrance ramp. This 5-lane cross section is then carried across the Central Viaduct.

***Bottleneck 4: I-90 at the Innerbelt Curve***

The extreme geometry of the existing Innerbelt Curve causes both operational problems as motorists slow down in approach to the curve and safety problems. Further, under the current configuration only two of the four westbound I-90 lanes continue through the curve, with the remaining lanes dropping to SR 2. To address this bottleneck, the Innerbelt Curve is "flattened". As part of this proposed change, three through westbound lanes would continue through the curve and into the trench area and a new Trumpet-type system interchange with SR 2 would be constructed.

In addition to the changes proposed that are related to the four primary bottlenecks in the corridor, improvements to existing transit service are also proposed. Further, an Intelligent Transportation System (ITS) component is proposed. Finally, the pavement and bridge deck rehabilitation, as described in the Minimum Hybrid Alternative, is also included in this option.

### 1.11.3 Advanced Hybrid Alternative

The Advanced Hybrid Alternative (Figure 1-26) represents the next, higher level of investment for improving the Innerbelt Corridor. In addition to relieving the corridor's major bottlenecks and replacing/rehabilitating the facility's bridge decks and roadway pavements, this alternative introduces the following:

- New Cuyahoga River Valley Consolidated Intermodal Connector utilizing centralized freeway access
- Widened Central Viaduct Bridge with outside breakdown shoulders
- Improved Central Interchange
- Relocated and improved access point to/from I-77
- Calmed Cleveland Memorial Shoreway to a Lakefront Boulevard
- Improved Innerbelt curve
- New University Circle Access Boulevard.

FIGURE 1-26:

# Advanced

***These improvements add capacity, improve flow of traffic, and improve safety.***

***Cuyahoga River Valley Consolidated Intermodal Connector***
The Eagle Avenue Viaduct Study has indicated that there is a need to create an Intermodal Connector in order to route trucks from the Flats and Port areas to the freeway system without using the local, residential street system. There is special concern over truck traffic in the Tremont neighborhood using local, residential streets to reach the interstates.

***Central Viaduct Bridge Modifications***
The existing Central Viaduct Bridge would be widened to accommodate five 12-foot travel lanes plus 10-foot outside shoulders in each direction. The existing bridge deck and stringers would be replaced and the existing superstructure and substructure would be modified to accommodate the widening.

***Central Interchange Modifications***
The goal of this interchange improvement is to improve the overall operation of the Central Interchange by relocating the interchange of I-77 traffic to/from the local streets. This relocation will improve capacity for all the traffic movements and, as a result, improve safety. Thus, all local movements to/from I-77 are relocated to the reconfigured Broadway/Orange Boulevard interchange area.

As with the Central Interchange improvements described as part of the Intermediate Hybrid Alternative, changes would be made to the mainline I-90 access to configure both Ontario Street and East 9th Street ramps as add/drop lanes. This requires the widening of the Central Viaduct bridge to five travel lanes in each direction.

***I-77 Access Improvements***
A key to improving traffic flow, capacity, and safety to and through the Central Interchange is to separate the I-77 access to the local street grid from the Central Interchange. This is accomplished by improving the current I-77 interchange with East 30th Street and removing I-77 access from the Central Interchange area.

***Trench Modifications***
In the trench area of the Innerbelt (Carnegie Curve to Innerbelt Curve), access would be consolidated. As part of this consolidation of access, the eastbound I-90 to Carnegie Avenue exit ramp, the Prospect Avenue interchange and the westbound Chester Avenue to eastbound I-90 entrance ramp would be removed. Access to the Prospect/Carnegie corridors would be facilitated through the Central Interchange area via access to Carnegie Avenue.

The existing eastbound Chester Avenue to eastbound I-90 entrance ramp and eastbound I-90 to eastbound Chester Avenue exit ramp would be reconfigured to permit access from both eastbound and westbound Chester Avenue. In addition, the westbound I-90 to Chester Avenue exit ramp and Superior Avenue to westbound I-90 entrance ramp would be braided to eliminate the existing weave.

***Lakefront Boulevard and Innerbelt Curve***
It is proposed that the existing Cleveland Memorial Shoreway (SR 2), west of the Innerbelt Curve to the Main Avenue Bridge over the Cuyahoga River, be downgraded to a boulevard roadway—the "Lakefront Boulevard". This Lakefront Boulevard would be a 6-lane facility with a median. This would allow the current system interchange between the existing Cleveland Memorial Shoreway and the Innerbelt to be downgraded to a local service interchange.

As in the changes to the Innerbelt Curve proposed by the Intermediate Hybrid Alternative, three westbound I-90 lanes would be carried around the Innerbelt Curve and into the trench area. Further, the existing entrance ramp from St. Clair Avenue to eastbound I-90, the existing exit ramp from eastbound I-90 to Lakeside Avenue, and the existing entrance ramp from Lakeside Avenue to westbound I-90 would be removed.

***University Circle Access Boulevard***
A portion of the traffic that currently travels the Innerbelt Freeway is traffic destined for the University Circle area. The goal of the University Circle Access Boulevard is to provide direct access between the freeway system and University Circle to relieve traffic pressure on the Innerbelt Freeway. The proposed boulevard would be a 6-lane facility with a median. The boulevard would begin near the existing intersection of I-490 and East 55th Street.

***Components Included From Intermediate Hybrid Alternative***
The following Intermediate Hybrid Alternative components are also components of the Advanced Hybrid Alternative:

- Southern Innerbelt Improvements
- Widen Central Viaduct to Ten Travel Lanes
- Flattened Innerbelt Curve
- Express Bus Service/Park & Ride Expansion
- Intelligent Transportation System
- Pavement and Bridge Deck Replacement/Rehabilitation.

### 1.11.4 Maximum Hybrid Alternative

The Maximum Hybrid Alternative (Figure 1-27) represents the highest level of investment for improving the Innerbelt Corridor. At this level, additional components that are addressed include:

- Reconfigured collector-distributor roadways between Fulton Road and West 25th Street
- New Flats Intermodal Connector utilizing disbursed freeway access
- New Central Viaduct Bridge on existing or new alignment
- Completely reconstructed Central Interchange
- Relocated and improved access point to/from I-77
- Frontage road system in the trench area
- Local street priority corridor system
- Reconstructed CSX railroad bridge

FIGURE 1-27:

# Maximum

- Waterfront Line extension
- Improvement in access for rail Park and Ride lots.

These proposed improvements address operation, safety, and access at the highest level.

***Reconfigure Collector-Distributor (C-D) Roadways***
The existing collector-distributor roadway system between Fulton Road and West 25th Street is proposed for reconstruction as part of this alternative. In the current configuration, the existing C-D roadways climb the embankment between interchanges and run along the top of the embankment, directly adjacent to the neighborhood. A C-D roadway system is typically constructed at the same grade and directly adjacent to the mainline freeway. Thus, when reconstructed, these C-D roadways would be relocated and the top of the existing slope would be returned to a natural vegetative state.

***Cuyahoga River Valley Consolidated Intermodal Connector***
As in the Advanced Hybrid Alternative, an Intermodal Connector is proposed. However, in this alternative, the access that is provided to the freeway network is to be provided in a disbursed manner rather than in a consolidated manner.

***Central Viaduct Bridge Modifications***
As part of this alternative, the Central Viaduct Bridge would be reconstructed either on the existing alignment or on a new, parallel alignment. This new bridge would provide for five 12-foot travel lanes and 10-foot outside breakdown shoulders in each direction.

***Reconstruct Central Interchange***
As in the Advanced Hybrid Alternative, all local movements to/from I-77 are relocated to the reconfigured Broadway/Orange Boulevard interchange area. Once the interchange between I-77 and the local street grid is relocated, the remaining movements are completely reconstructed.

***I-77 Access***
This is accomplished by improving the current I-77 interchange with East 30th Street and removing I-77 access from the Central Interchange area.

***Frontage Road System (Trench Area)***
This alternative addresses this traffic flow issue by creating a frontage road system from Chester Avenue north to St. Clair Avenue. This frontage road system consolidates direct access to the freeway, while maintaining access to all cross-streets within the area of the frontage road system. Direct access, entrance and exit, from the freeway to the frontage road system will be provided at Chester Avenue and Superior Avenue. The frontage road concept removes the existing interchanges at both Prospect Avenue and Carnegie Avenue. Access to these corridors would be provided through the reconfigured Central Interchange area.

***Priority Corridor System***
In conjunction with the freeway improvements are CBD roadway improvements. The CBD roadway improvements are to reinforce the street system hierarchy.

***Reconstruct CSX Railway Bridge***
The roadway narrowing of East 55th Street from four lanes to two lanes beneath the existing CSX railroad bridge is proposed to be improved. The "pinch" is removed and two lanes in each direction are provided.

***Waterfront Line Extension***
The Waterfront Line Extension completes a "loop" of the existing Waterfront light rail line from its present termini at South Harbor to a new station interfacing with the existing Red Line at East 30th Street. This "loop" follows the "preferred" alignment outlined in the Waterfront Transit Line Phase II MIS. The general alignment extends from the South Harbor Station south on East 17th Street to Prospect Avenue, then east on Prospect to the vicinity of East 21st Street, then south to Community College, then east to East 30th Street, then south to a termini with the Red Line.

***Express Bus Service/Park & Ride Expansion***
In addition to the Express Bus Service/Park & Ride Expansions utilized in the Intermediate and Advanced Hybrid Alternatives, the Maximum Hybrid Alternative takes that a step further.

Improvements to the Triskett Station Park and Ride include the addition of median off-ramps that drop motorists directly into the park and ride lot from I-90. Anticipating extensive demand, expansion of the park and ride lot dimensions occur to provide additional capacity. The Puritas Station Park and Ride also is served by a new dedicated ramp from northbound I-71 to the parking area. Structured parking may be recommended to increase the parking capacity as needed.

***Components Included From Advanced Hybrid Alternative***
The following Advanced Hybrid Alternative components are also components of the other hybrids:

- New Local Interchange with Lakefront Boulevard
- New Lakefront Boulevard
- Increase CBD Access to Lakefront Boulevard
- University Circle Access Boulevard
- Southern Innerbelt Improvements
- Widen Central Viaduct to Ten Travel Lanes
- Flattened Innerbelt Curve
- Express Bus Service/Park & Ride Expansion
- Intelligent Transportation System
- Pavement and Bridge Deck Replacement/Rehabilitation.

### 1.11.5 Hybrid Component Analysis

Further discussion is presented on those components that did not advance. This included: Waterfront Line Extension, Triskett Park and Ride direct access, Puritas Park and Ride direct

access, Triskett Park and Ride low cost direct access and Puritas Park and Ride low cost direct access.

### 1.11.5.1 Waterfront Line Extension

The Waterfront Extension was developed and analyzed in detail in the Waterfront Major Investment Study (MIS) conducted by MK Centennial for GCRTA during 1999-2000. The proposed extension offers a variety of service improvements, including better coverage of downtown, improved service to the Lakefront parking lot, and enhanced access to the CSU/Tri-C area and Playhouse Square. The extended LRT provides a broader reaching "distributor" service to Red Line Passengers. In addition, the extended line would enhance travel within the downtown area.

The capital cost for the Waterfront extension is approximately $130 million in 2002 dollars. This does not reflect additional vehicles that would be required to operate the expanded service outlined above.

While the Waterfront Extension identified in the Waterfront Transit Line MIS offers improved service to and within the downtown area, the impacts on Innerbelt operations are not substantial. Therefore, given the relatively high cost of the Waterfront Extension compared to the minimal Innerbelt Freeway impacts, it was recommended that the improvement not continue forward as part of the Recommended Design Concept and Scope. Although the Waterfront Extension is no longer part of an alternative under the Cleveland Innerbelt Study, the opportunity for this extension should not be precluded.

### 1.11.5.2 Triskett Park-n-Ride Direct Freeway Connection

Improvements to the Triskett Station Park-and-Ride include the addition of an exit ramp that brings motorists directly into the Park-and-Ride lot from eastbound I-90. Two configurations were considered: a left-side median exit and a right-side exit.

The left-side exit could physically be constructed within the median of I-90, west of the Warren Road entrance ramp to eastbound I-90. This configuration would necessitate the construction of a bridge over West 140th Street and new retaining walls. This exit would also not be able to provide true direct access, as it would have to intersect other roadways before it connected to the Park-and-Ride. A left-side exit ramp is not a recommended geometric configuration, due to I-90 being a high-speed facility. Therefore it is not recommended that a left-hand exit be constructed for this Park-and-Ride.

A right-side exit ramp could be provided, but would take a substantial amount of structures and money to construct. To provide proper ramp spacing, the closest location of the exit to the Triskett Station Park-and-Ride would need to occur between the eastbound Alger Road and Warren Road ramps. Since the freeway is depressed in this area, a large retaining wall would need to be constructed. This ramp would then pass under Warren Road, the Warren Road entrance ramp, Bunts Road, and then under the Bunts Road entrance ramp. Then, the ramp would intersect Joslyn Road and Elleroy Court, as would a median exit ramp. Also, as

with a median exit, direct access could not exactly be provided, as the ramp would intersect two roadways before entering the parking lot of the Park-and-Ride. This alternative would most likely include the construction of a facility over a half-mile long; construction of several new bridges; creation of a three-level interchange; construction of several, large retaining walls; and creation of two new intersections before the ramp would access the Park-and-Ride.

Conclusions regarding the analysis of the proposed ramps serving the Triskett Park-and-Ride lot are described as follows:

- Its current function as a local Park-and-Ride lot would not be greatly enhanced by the addition of the proposed I-90 ramps. The existence of RTA Park-and-Ride facilities, downtown express service, and other bus routes in Westlake and North Olmstead limits its local market area
- Long distance commuters to the CBD, who may view Triskett as a periphery Park-and-Ride lot, are relatively small in number. The potential to capture this market is further reduced by its five-mile distance to the CBD, which is much greater than most periphery Park-and-Ride lots
- The time savings between I-90 and the Triskett Park-and-Ride lot from the proposed ramps is estimated at three to four minutes over the current configuration. It is questionable whether this will be enough to significantly increase demand to use this lot.

Therefore under current conditions, there is limited potential to expand the market area for the Triskett Park-and-Ride lot by adding direct access ramps from eastbound I-90 and to westbound I-90. Thus, the Triskett Park-and-Ride direct access ramps were not recommended for inclusion in the Recommended Design Concept and Scope. If conditions change, such as worsened traffic congestion or increased parking or other transportation costs, then its viability could improve. Under special circumstances, such as when the Innerbelt Freeway improvements are under construction and traffic congestion is much worse, the attractiveness of using the Triskett Station as a means to access downtown Cleveland may improve.

### 1.11.5.3 Puritas Park-n-Ride Direct Freeway Connection

Improvements to the Puritas Station Park-and-Ride include the addition of an exit ramp. This exit ramp brings motorists directly into the Park-and-Ride lot from northbound I-71. The estimated capital cost of this direct access exit ramp is $8,200,000 in 2002 dollars. However, further analysis of the travel time difference between the current interchange at West 150th Street and proposed configuration, shows that there is only a difference of one to two minutes between I-71 and the Puritas Station.

Due to the limited travel time savings in the vicinity of the Puritas Station and I-71, there was minimal potential for increasing Park-and-Ride lot usage from the building of these ramps. It was therefore eliminated from consideration for inclusion in the Recommended Design Concept and Scope.

In addition to the high cost, direct access ramp to the Triskett Station Park-and-Ride, a lower cost alternative was considered. This connection is an extension of South Marginal Drive eastward from West 140th Street to Joslyn Road. This extension would require the construction of retaining walls due to the location of the roadway on the existing slope of I-90 with the close proximity of homes on the south side. In order for the extension to provide access to the park-and-ride, a connection between Joslyn Road and Elleroy Court would need to be constructed. Houses sit on the opposite side of the South Marginal Drive extension. Because of this, the Joslyn Road and Elleroy Court connection could be located under the I-90 bridge. This extension and connection would cost $1.8 million.

The new route along the extension, over on Joslyn Road, and across the connection to Elleroy Court would allow a motorist to save 1,150'±, or 0.2± miles, on a trip to the Triskett Park-and-Ride. Travel time savings would be less than a minute. The extension and connection would create three new intersections. For the same reasons listed for the direct access ramp to the Triskett Station Park-and-Ride, the South Marginal Road Extension was not recommended for inclusion in the Recommended Design Concept and Scope.

After examination of the existing roadway layout near the Puritas Station Park-and-Ride, there appears to be no low-cost access improvement alternative to the higher cost direct access ramp to the park-and-ride.

#### 1.11.5.4 Euclid Park-n-Ride Wayfinding Improvements

It was recommended that wayfinding improvements for the Euclid Park-and-Ride be eliminated from the Recommended Design Concept and Scope. While warranted, the improvements were considered to have minimal impact on the Innerbelt Corridor. Therefore, this component was not recommended for inclusion in the Recommended Design Concept and Scope.

## 1.12 RECOMMENDED DESIGN CONCEPT AND SCOPE

The components of the Recommended Design Concept and Scope were presented in a booklet released to the Scoping Committee in December 2003. This document was subsequently revised in January 2004 and February 2004.

### 1.12.1 Components to be Included in the Recommended Design Concept and Scope

The following components were recommended for inclusion in the Recommended Design Concept and Scope:

- Collector-Distributor Roadway
- Southern Innerbelt Improvements
- Cuyahoga River Valley Consolidated Intermodal Connector
- Central Viaduct Bridge
- Central Interchange Reconstruction/I-77 Access
- Frontage Road System

- Flattened Innerbelt Curve
- Priority Corridor System
- University Circle Access Boulevard
- Reconstruct CSX Railway Bridge on E 55th Street
- Westlake Park-and-Ride Expansion
- Strongsville Park-and-Ride Expansion
- North Olmsted Park-and-Ride Expansion
- Intelligent Transportation System (ITS).

See Chapter 2 for descriptions of these components and reasons for their inclusion as part of the Recommended Design Concept and Scope.

## 1.13 INFORMATION CATALOG

Below is a listing of all relevant reports and circulars that were created as part of this study. Because of the large scope of this study, it is not possible to reprint all of this information as part of this document. As such, critical information from these documents has been summarized as part of this chapter. For full details regarding a particular work product, please refer to the source documents listed:

Public Involvement Document – May 2004
Final Existing and Future Conditions Report – April 2004
Red Flag Summary – April 2004
Design Concept and Scope – February 2004
Hybrid Alternatives – June 2003
Purpose and Need – April 2003
Performance Measures – January 2003
Alternative Concepts – July 2002
Alternative Concepts – May 2002
Alternative Concepts – April 2002
Alternative Concepts – November 2001
Concept Alternatives – October 2001
Decision Memos

- Cuyahoga River Valley Consolidated Intermodal Connector (CRVCIC) Addendum II – February 2004
- Cuyahoga River Valley Consolidated Intermodal Connector (CRVCIC) Addendum – January 2004
- Public Transit Improvements for the Innerbelt Corridor Addendum – January 2004
- Public Transit Improvements for the Innerbelt Corridor – December 2003
- Cuyahoga River Valley Consolidated Intermodal Connector – December 2003
- Central Viaduct Bridge – November 2003
- University Circle Access Boulevard – October 2003
- Innerbelt Trench – October 2003
- Priority Corridors – October 2003
- Central Interchange and I-77/East 30th Street Interchange – October 2003

- Southern Innerbelt Improvements – September 2003
- Intelligent Transportation System (ITS) – September 2003
- Innerbelt Curve – September 2003
- Collector-Distributor (C-D) Roadways – September 2003
- High Occupancy Vehicle (HOV) facilities and bus bypasses – August 2003
- Waterfront LRT Extension Option – June 2003
- Trench Components – June 2003.

Website – www.innerbelt.org

# CHAPTER TWO
# Recommendations

# CHAPTER TWO

# RECOMMENDATIONS

## 2.1. DESIGN CONCEPT & SCOPE

This study sought to address the problems outlined in the Purpose and Need Statement through development of this Strategic Plan for the intelligent renewal of the transportation infrastructure in the corridor. The alternative outlined in this document has been developed to address the problems outlined in the Purpose and Need. It is anticipated that in 2006 ODOT will initiate construction of a sequence of projects that will comprise this overall strategy.

In the Hybrid Alternatives Analysis phase of the process, the Design Concept and Scope (Figure 2-1) was developed through the refinement of alternatives, with the assistance of the Cleveland community. ODOT held an ongoing series of meetings with the public to gather input and ideas to refine the alternatives. The Design Concept and Scope presented in this document is a refinement of the Hybrid Alternatives and Conceptual Alternatives.

***Description***

The following summary highlights the required elements of the work within each major freeway segment.

Pavement and Bridge Deck Replacement/Rehabilitation includes:

- I-71 mainline pavement replacement/rehabilitation from the Fulton Road interchange north to the south end of the Central Viaduct
- I-90 mainline pavement replacement/rehabilitation from the north end of the Central Viaduct to just east of the Innerbelt Curve, located at the Cleveland Memorial Shoreway interchange
- I-77 mainline pavement replacement/rehabilitation from the Kingsbury Run Bridge to the Central Interchange
- Ramp and connecting roadway pavements replacement/rehabilitation.

All of the remaining original bridge decks along the Innerbelt mainline and the interchange bridges within the corridor need to have their decks replaced within the renewal time frame.

In addition to the elements of work required to renew the physical condition of the Innerbelt Freeway, the following discusses the various components necessary to address the Cleveland Innerbelt Study's Purpose and Need. For more detail on these components, please refer to the corresponding Decision Memorandum. Concerns with the Design Concept and Scope raised by the City of Cleveland for consideration during Steps 5-8 of the PDP are summarized in Appendix B. Letters from various stakeholders are included as an addendum to the Design Concept and Scope document, to further serve as documentation of the concerns raised during the study.

FIGURE 2-1:

# Design Concept and Scope

CLEVELAND INNERBELT STUDY
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- A: Reconfigure collector-distributor roadways
- B: Southern Innerbelt Improvements
- C: Cuyahoga River Valley Intermodal Connector with either reconstructed I-490/west 7th Street Interchange (C1) or new, low-level river crossing (C2)
- D: New or existing Central Viaduct with 10 travel lanes plus outside shoulder
- E: I-77 access changed to continuous flow interchange
- F: Reconstruction of Central Interchange
- G: Frontage Road System
- H: Flattened Innerbelt Curve and new local interchange with Lakefront Boulevard
- I: Priority Corridor System
- J: Reconstruct CSX railway bridge
- K: University Circle Access Boulevard


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Design Concept and Scope Components are as follows:

- Collector-Distributor Roadway
  - Relocate the C-D Roadway between Fulton Road and West 25th Street at the same grade as and adjacent to mainline I-71
- Southern Innerbelt Improvements
  - Add one northbound mainline lane to I-71 between SR-176 and I-90
  - Add one lane in each direction on I-90 between I-71 and the Central Viaduct Bridge
- Cuyahoga River Valley Intermodal Connector
  - Complete the I-490/West 7th Street interchange upgrade to full interchange or add new lift bridge to access existing Broadway partial interchange.
  - Quigley Road Connector
  - Rehabilitate West 3rd Street and Quigley Road
  - West Bank Connector
  - Jennings Road to Quigley Road Connector.
- Central Viaduct Bridge
  - Add one lane in each direction to I-90
  - Minimum inside shoulder
  - Full outside shoulder
  - Existing or New Bridge
  - Existing or Parallel Alignment
- Central Interchange Reconstruction/I-77 Access
  - Central Interchange
    - Separation of System and Service Movements
    - Consolidation of Access
    - Access provided to Ontario Street, East 9th Street and East 18th Street
    - I-77NB to I-90WB and I-90EB to I-77SB movements redirected to I-490/I-77 Interchange
  - I-77 Access
    - Separation of System and Service Movements
    - Consolidation of Access
    - I-77 access in Central Interchange redirected to Orange and Woodland Boulevards
- Frontage Road System
  - Consolidation of Access
  - Freeway Ramp Connections at Chester Avenue and Superior Avenue
  - Frontage Road System between Chester Avenue and St. Clair Avenue
- Flattened Innerbelt Curve
  - Flatten I-90 mainline curve
  - Add one westbound to I-90 within interchange
  - Reconstruct I-90/SR-2 interchange
  - Convert System interchange to Service interchange
  - Construct E 40th Street overpass
- Priority Corridor System
  - Operational Improvements to:

  - East 9th Street
  - East 18th Street
  - Ontario/Woodland Corridor
  - Frontage Road Corridor
  - Carnegie Avenue
  - Chester Avenue
  - Superior Avenue
  - Lakefront Boulevard
- University Circle Access Boulevard
- Reconstruct CSX Railway Bridge on E 55th Street
- Westlake Park-and-Ride Expansion
- Strongsville Park-and-Ride Expansion
- North Olmsted Park-and-Ride Expansion
- Intelligent Transportation System (ITS)
  - Freeway Management System
  - Arterial Management System
  - MOA/MOT Management System.

## 2.2. PROJECT BREAKDOWN

### 2.2.1 Innerbelt Project

#### 2.2.1.1 Innerbelt Logical Termini

***Primary Logical Termini***

The primary logical termini for the Innerbelt Project are the I-71/SR-176 interchange and the I-90/SR-2 interchange (). The primary logical termini define the limits of the Innerbelt Freeway. The selection of the logical termini was based on an evaluation of a number of different parameters:

- Function
- Operational Performance (Running Speed and Level of Service)
- Safety (Crash Analysis)
- Infrastructure.

The I-71 interchange with SR-176 (Jennings Freeway) was selected as one of the primary logical termini because the convergence point of these two radial freeways establishes the southwestern-most limits of the Innerbelt Freeway. In addition, the convergence of these two radial freeways coincides with the following:

- Southwestern-most convergence point of the system of radial freeways
- Daily recurring congestion occurs at the point where the basic number of lanes on NB I-71 is reduced from three lanes to two
- Daily recurring congestion occurs south of the point where the lane of NB SR-176 must merge into the two lanes of NB I-71

- The 1996 *Freeway System Bottleneck Study* conducted by the Northeast Ohio Areawide Coordinating Agency (NOACA) indicates that the Level of Service (LOS) drops to an LOS F during the AM peak period in the two-lane section of NB I-71
- The crash analysis attributes the elevated crash rate (2.18/Million Vehicle Mile [MVM]) and percentage of rear-end accidents (41.3 percent) to the inability of drivers to safely adjust their travel speed in response to the daily recurring congestion that results from the reduction in the basic number of lanes from three to two
- The concentration of bridge decks begins at this system interchange.

The I-90 (Memorial Shoreway-East) interchange with SR-2 (Memorial Shoreway-West) was selected as the northern logical terminus because the convergence point of these two radial freeways establishes the northeastern-most limits of the Innerbelt Freeway. In addition, the convergence of these two radial freeways coincides with the following:

- Northeastern-most convergence point of the system of radial freeways
- The concentration of downtown service interchanges begins immediately west of this system interchange
- Daily recurring congestion occurs at the points where the basic number of lanes on WB I-90 is reduced from four to two
- The 1996 NOACA *Freeway System Bottleneck Study* indicates that the level of service drops to a LOS F during the AM peak period in the two-lane section of westbound I-90
- The crash analysis attributes the elevated percentage of failure to control crashes (32.5 percent) to the inadequate horizontal geometry in this location. There were a total of nine crashes in a 3-year period that involved vehicles overturning at this location.

***Intermediate Logical Termini***

A number of freeways radiate from the Cleveland Innerbelt Freeway. In addition to the primary logical termini of the Innerbelt Freeway described above, there is a need to describe the intermediate logical termini for each of the radial freeways. The intermediate logical termini define the Innerbelt Corridor or project area (). The selection of the intermediate logical termini for the radial freeways was based primarily on operational performance.

The Fulton Road/West 25$^{th}$ Street interchange was selected as the intermediate logical termini on I-71 because this pair of interchanges, which share a common collector-distributor roadway system, coincides with the following:

- This is the first interchange along this radial freeway south of where it enters the Innerbelt Freeway
- The number of through lanes is reduced from four lanes to three lanes immediately south of this pair of interchanges
- The 2002 NOACA travel time study indicates that during the AM peak period, running speeds drop from in excess of 60 mph south of West 25$^{th}$ Street to less than 20 mph north of West 25$^{th}$ Street

- Fulton Road, West 25th Street, and Scranton Road are used as alternate routes to the Central Business District (CBD).

The I-90 (Memorial Shoreway-East) interchange with SR-2 (Memorial Shoreway-West) remains as the northern logical termini as discussed in the previous section describing the Primary Logical Termini.

The East 9th Street interchange was selected as the western logical terminus on SR-2 because this interchange coincided with the following:

- This is the first interchange along this radial freeway west of where it enters the Innerbelt Freeway.

The Denison Avenue Interchange was selected as the southern logical terminus on SR-176 because this interchange coincides with the following:

- This is the first interchange along this radial freeway south of where it enters the Innerbelt Freeway
- The NOACA travel time study indicates that during the AM peak period running speeds drop from 62 mph south of Denison Avenue to less than 20 mph north of Denison Avenue.

The East 30th Street/Woodland Avenue Interchange was selected as the southern logical terminus on I-77 because this interchange coincides with the following:

- The East 30th Street/Woodland Avenue interchange is the first in a series of interchanges that provide direct access to the CBD from I-77
- The NOACA travel time study indicates that during the AM peak period, northbound running speeds drop from in excess of 45 mph south of the East 30th Street/Woodland interchange to 38 mph north of the interchange
- The concentration of bridge decks begins immediately north of this interchange. There are also two pairs of bridges located immediately south of this interchange; however, the Kingsbury Run Bridges (CUY-77-1457 L&R) were replaced in 2000 and the decks of the I-77 bridges over I-490 (CUY-77-14.35 L&R) are scheduled to be replaced and widened in 2009.

The West 7th Street interchange was selected as the eastern logical terminus on I-490 because this interchange coincides with the following:

- This is the first interchange along this radial freeway east of where it enters the Innerbelt Freeway.

The I-90/West 25th Street interchange was selected as the western logical terminus on I-90 because this interchange coincides with the following:

- This is the first interchange along this radial freeway west of where it enters the Innerbelt Freeway

- The NOACA travel time study indicates that during the AM peak period running speeds drop from 60 mph west of West 25th Street to 26 mph west of the I-90/I-71/I-490 interchange.

The Central Interchange (Figure 1-1), as defined for this study, is a triangular area bounded by Carnegie Avenue on the north, East 22nd Street on the east and Broadway Avenue on the southwest, and includes the system interchange between I-77 and I-90, as well as the connections between these two Interstate highways and the local street system.

### 2.2.1.2 Innerbelt Project Description

In addition to the required pavement and bridge deck elements of work needed along the Innerbelt Freeway, the following discusses the various components necessary to meet the Cleveland Innerbelt Study's Purpose and Need. The format of the following discussion includes a description of the listed component, followed by the recommendation summary from the corresponding Decision Memorandum.

***Reconfigure Collector-Distributor (C-D) Roadways***
The existing C-D roadway system between Fulton Road and West 25th Street is proposed for reconstruction. In the current configuration, the existing C-D roadways climb the embankment between interchanges and run along the top of the embankment, directly adjacent to the neighborhood. A C-D roadway system is typically constructed at the same grade and directly adjacent to the mainline freeway. Thus, when reconstructed, these C-D roadways would be relocated and the top of the existing slope would be returned to a natural vegetative state.

***C-D Roadways Summary***
*Collector-Distributor (C-D) Roadways (September 11, 2003)* – As this segment of the roadway pavement is reconstructed, it would be advantageous to relocate the C-D roadways to a location directly adjacent to and at the same grade as the mainline. The vacated land resulting from the relocation of the C-D roadways would be returned to a natural, vegetative state. The cost to relocate the C-D roadways at the same time as I-71 is reconstructed would be less than the cost of relocating the C-D roadways project independently. From an operational and safety standpoint, there are no differences between C-D roadways at the top or bottom of the slope. Thus, it is recommended that at the time the mainline I-71 pavement between Fulton Road and West 25th Street is to be reconstructed, the C-D roadways should be relocated and reconstructed.

***Southern Innerbelt Improvements***
Two of the four primary bottlenecks within the study area are located in the section of the Innerbelt Freeway from the MetroHealth Curve to the southwestern end of the Central Viaduct Bridge. These bottlenecks are addressed in this component of the Design Concept and Scope.

The solution proposed for the problems associated with these two bottlenecks has been commonly referred to as the "Southern Innerbelt Improvements" (Figure 2-2). Currently, a

bottleneck is associated with the MetroHealth Curve along I-71. This bottleneck is caused by the reduction of mainline I-71 from three lanes to two lanes in the segment preceding the SR-176 (Jennings Freeway) merge. This mainline reduction is currently in place to improve the merge with traffic from I-90 eastbound. The merge is accomplished by allowing two lanes from I-71 northbound and two lanes from I-90 eastbound to join, forming the existing four-lane, eastbound cross section of the Central Viaduct Bridge. Further, the entrance from the Jennings Freeway to I-71 northbound is also a bottleneck. The heavily traveled Jennings Freeway terminates at a merge with the two northbound lanes of I-71. The volume of traffic utilizing this merge results in severe congestion in the peak period.

To eliminate these two bottlenecks, I-71 northbound will be widened to three lanes in the area of the Jennings Freeway merge. This widening of I-71 will be accomplished within the existing highway right-of-way (Figure 2-2). The widening of I-71 northbound will require the widening of I-90 eastbound across the Central Viaduct Bridge from four to five lanes. This will allow the three lanes of I-71 northbound plus the two lanes of I-90 eastbound to form the five travel lanes on the Central Viaduct Bridge.

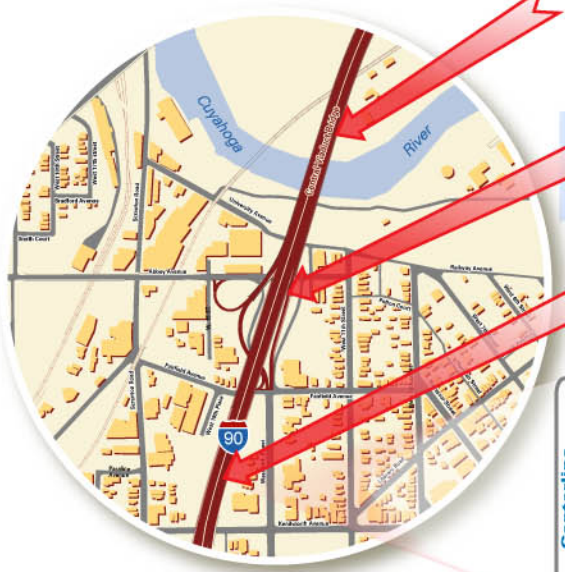
Currently, westbound I-90 across the Central Viaduct Bridge functions with four westbound lanes. At the start of I-71 southbound, westbound I-90 diverges with a drop-lane and decision-lane configuration. The outermost lane is an exit only lane and the adjacent lane is a combined exit and through lane, where the driver must make a decision to either exit or continue through on the current path of travel. This configuration provides two exit lanes for I-90 three through lanes for I-71. Improvements to the Central Interchange area includes an additional I-90 westbound lane, making a total of five travel lanes crossing the Central Viaduct Bridge, approaching the I-71/I-90 diverge. To accommodate this widening of the Central Viaduct Bridge, as southbound I-71 exits from westbound I-90, the two outermost lanes would connect to westbound I-90 and the three innermost lanes would connect to southbound I-71 (Figures 2-3, 2-4, and 2-5).

Due to the widening of I-90 from four travel lanes to five travel lanes in each direction, the West 14th Street entrance and Abbey Avenue exit ramps will be realigned.

***Southern Innerbelt Improvements Summary***

*Southern Innerbelt Improvements (September 11, 2003)* – The safety and operational impacts of the existing lane imbalance in the Southern Innerbelt area are severe. This lane imbalance causes increased congestion in the AM peak period, which results in increased crashes on this segment of roadway. Further, the convenient congestion by-pass offered by the configuration of the West 14th Street interchange encourages commuters to cut-through the neighborhood to avoid being caught in the resultant queues. The operational modeling of this component shows that the proposed reconfiguration of the Southern Innerbelt area has a positive impact on mainline operation and reduces cut-through traffic along West 14th Street. The improvements associated with the University Circle Access Boulevard and the complete reconstruction of the Central Interchange are shown to have a synergistic impact on further

# FIGURE 2-2: Southern Innerbelt Improvements

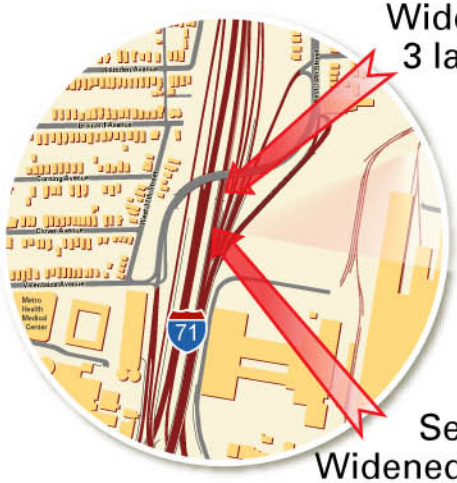




Widen both eastbound and westbound Central Viaduct Bridge from 4 lanes to 5 lanes

Modify Abbey Avenue entrance and exit ramps to provide standard lane tapering

Widen both eastbound and westbound I-90 roadways north of Kenilworth Avenue from 4 lanes to 5 lanes each. Provide retaining wall where needed to eliminate any right-of-way takes. (See illustration below for more detail)


No Right-of-Way acquisition is anticipated in the Tremont Neighborhood due to the proposed widening of I-71.




Widen to 3 lanes

See Widened Bridge Cross-Section


Widen Northbound I-71 from 2 lanes to 3 lanes north of West 14th Street Exit

FIGURE 2-3: Existing Southern Innerbelt

FIGURE 2-4: Proposed Southern Innerbelt

FIGURE 2-5: Southern Innerbelt (view from the neighborhood)

Existing 8-Lane I-71

Proposed 10 Lane I-71
with Retaing Wall
and Jersey Barrier

Proposed 10 Lane I-71
with Retaing Wall
and Noise Barrier

reducing this cut-through traffic. Thus, the Southern Innerbelt component is part of the Design Concept and Scope.

***Central Viaduct Bridge***

To accommodate the changes proposed for both the Southern Innerbelt area and the Central Interchange, the Central Viaduct Bridge will need to be widened to five travel lanes in each direction.

***Central Viaduct Bridge Summary***

*Central Viaduct Bridge (November 13, 2003)* – The interrelationship between the Central Viaduct Bridge and the Central Interchange and Southern Innerbelt areas was a key factor in determining the operational impacts of an alternative for the Central Viaduct Bridge. The high volume of traffic across the Central Viaduct Bridge coupled with the recommended Central Interchange and Southern Innerbelt area configurations requires that the Central Viaduct Bridge maintain five travel lanes in each direction to adequately address the operational issues in these three segments of the Innerbelt Freeway. Thus, widening the Central Viaduct Bridge to five travel lanes in each direction is part of the Design Concept and Scope.

The provision of an outside shoulder provides a breakdown refuge area for stranded motorists, allowing motorists who experience mechanical difficulty to move out of the traveled way. This preserves the full operational capacity of the Central Viaduct Bridge, which is especially important during peak hour operation. This breakdown shoulder further provides an area where emergency services can move incident involved vehicles. Thus, for safety and operational reasons, outside breakdown shoulders on the Central Viaduct Bridge are part of the Design Concept and Scope. For consistency reasons, full inside shoulders are not recommended across the Central Viaduct Bridge, as they are not provided elsewhere within the corridor.

To summarize, it is recommended that the Central Viaduct Bridge provide five travel lanes in each direction and outside breakdown shoulders.

***Central Interchange and I-77 Access***

The Central Interchange area represents one of the four primary bottlenecks that have been identified in the study area. The existing Central Interchange (I-90/I-77 interchange) must handle four traffic movements in a constrained geographic area. First, the Central Interchange handles the movement of traffic between I-90 and I-77. Second, it handles traffic interchanging between I-90 and the local street system. Third, it handles traffic interchanging between I-77 and the local street system. Fourth, it handles the movement of traffic on the local street system that is on one side of the Innerbelt and is traveling to the other side of the Innerbelt facility.

The goal of the interchange modification is to improve the overall operation of the Central Interchange by relocating the interchange of I-77 traffic to/from the local streets. This relocation will improve capacity for all the traffic movements and, as a result, improve

safety. Thus, all local movements to/from I-77 are relocated to the reconfigured Broadway/Orange Boulevard interchange area.

Once the interchange between I-77 and the local street grid is relocated, the remaining movements are completely reconstructed. Interface points between the freeway and local street grid are consolidated and reoriented to allow all ramps to be designed to current design standards. Further, these reconfigured access points will be easier to sign for wayfinding.

Due to the importance and of the Central Viaduct Bridge and the interdependency between the Central Viaduct Bridge, the Central Interchange, and the I-77 interchange with East 30th Street, the Central Viaduct Bridge configuration will dictate the configuration of the Central Interchange and I-77 interchange with East 30th Street. The Central Viaduct Bridge, as part of the Design Concept and Scope, could be a structure on the existing alignment or on a new alignment. If the structure remains on the existing alignment, the reconstructed Central Interchange (Figure 2-6) includes the following changes:

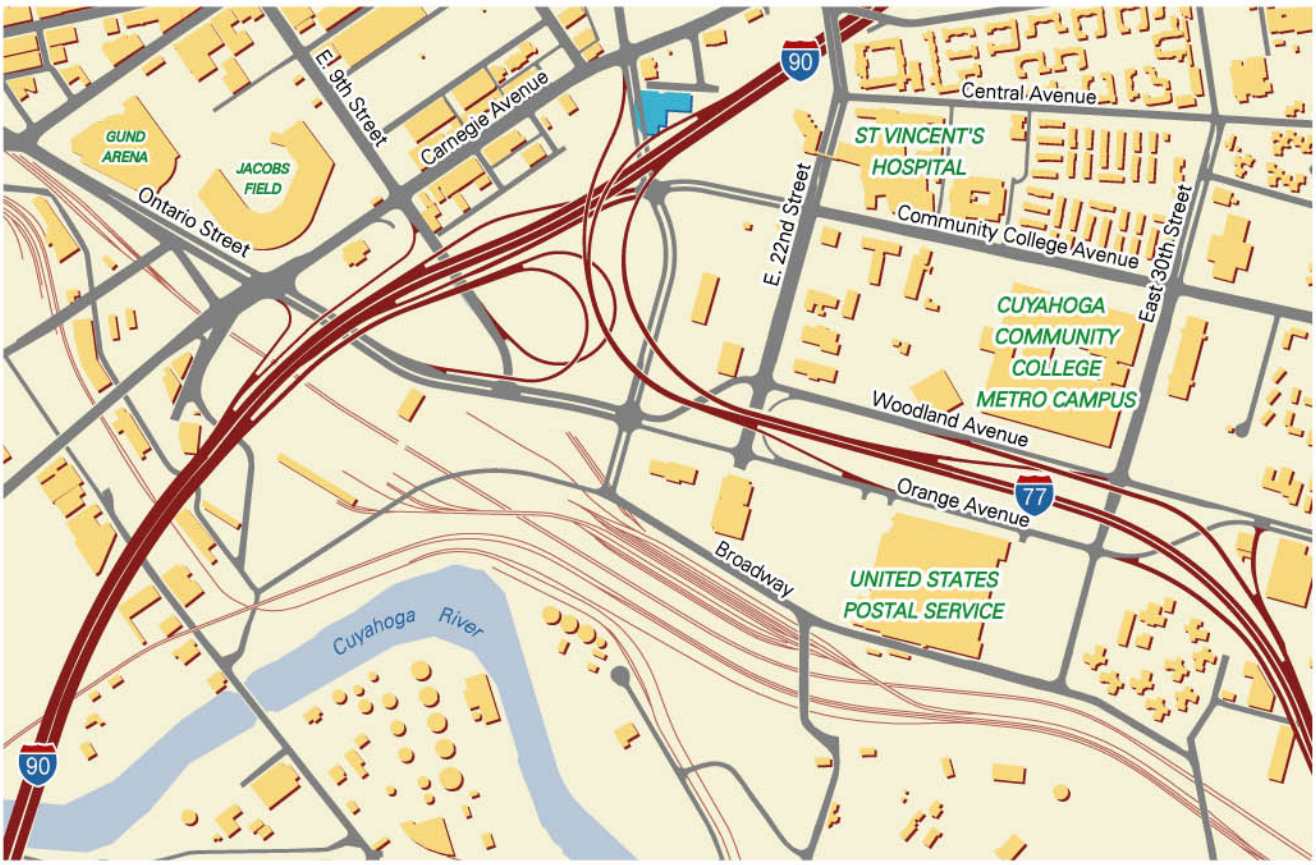
- Upgrade the loop ramp design speed to 45 mph
- Realign Community College Avenue and East 18th Street to form a new intersection
- Realign Ontario Street around the new I-90 exit loop ramp to Ontario Street
- Remove the I-77 southbound entrances from Ontario Street, East 9th Street, East 14th Street, and East 21st Street
- Remove the I-77 northbound exits to Community College Avenue, East 18th Street and East 22nd Street
- Remove the I-90 eastbound exit to Broadway Avenue and the exit to East 22nd Street
- Remove the I-90 westbound entrance from East 14th Street
- Connect Broadway to West 3rd Street for access to the Flats and Industrial Valley.

If the Central Viaduct Bridge is reconstructed on a new alignment, then the Central Interchange (Figure 2-6) further includes the following changes:

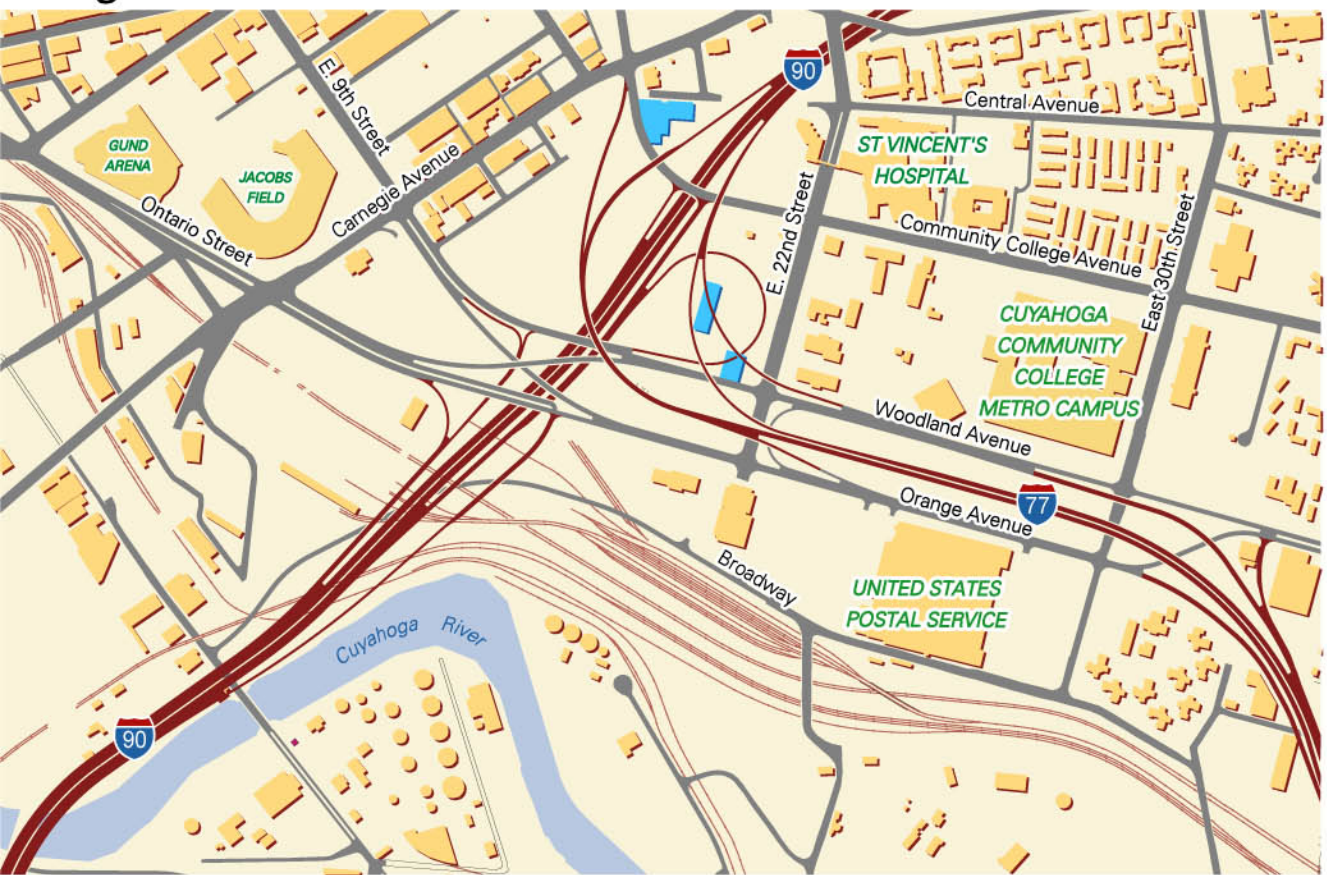
- Realign Ontario Street and East 9th Street to better interface with the one-way configuration of Woodland Avenue and Orange Avenue
- Realign Community College Avenue and East 18th Street to form a new corridor
- Provide access to I-90 at Ontario Street, East 9th Street and East 18th Street
- Remove the SB I-77 entrances from Ontario Street, East 9th Street, East 14th Street, and East 21st Street
- Remove the NB I-77 exits to Community College Avenue, East 18th Street and East 22nd Street
- Remove the EB I-90 exit to Broadway Avenue and the exit to East 22nd Street
- Remove the WB I-90 entrance from East 14th Street
- Provide access to the Intermodal Connector via Broadway to access the Flats and Industrial Valley.

A key to improving traffic flow, capacity, and safety to and through the Central Interchange is to separate the I-77 access to the local street grid from the Central Interchange. This is accomplished by improving the current I-77 interchange with East 30th Street and removing I-77 access from the Central Interchange area.

FIGURE 2-6: Central Interchange / I-77 Access




Bridge Reconstruction




Bridge Realignment

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The improved interchange, regardless if the Central Viaduct Bridge alignment changes, includes the following alterations:

- East 30th Street remains continuous beneath the interchange between the eastbound and westbound roadways of the Ontario/Woodland Boulevard
- Ontario/Woodland Boulevard eastbound to I-77 southbound and Ontario/Woodland Boulevard westbound to I-77 northbound are continuous movements
- I-77 northbound exit with the Ontario/Woodland Boulevard, East 30th Street with westbound Ontario/Woodland Boulevard
- East 30th Street with eastbound Ontario/Woodland Boulevard are all signalized intersections
- East 22nd Street thru connections remain.

***Central Interchange and I-77 Access Summary***

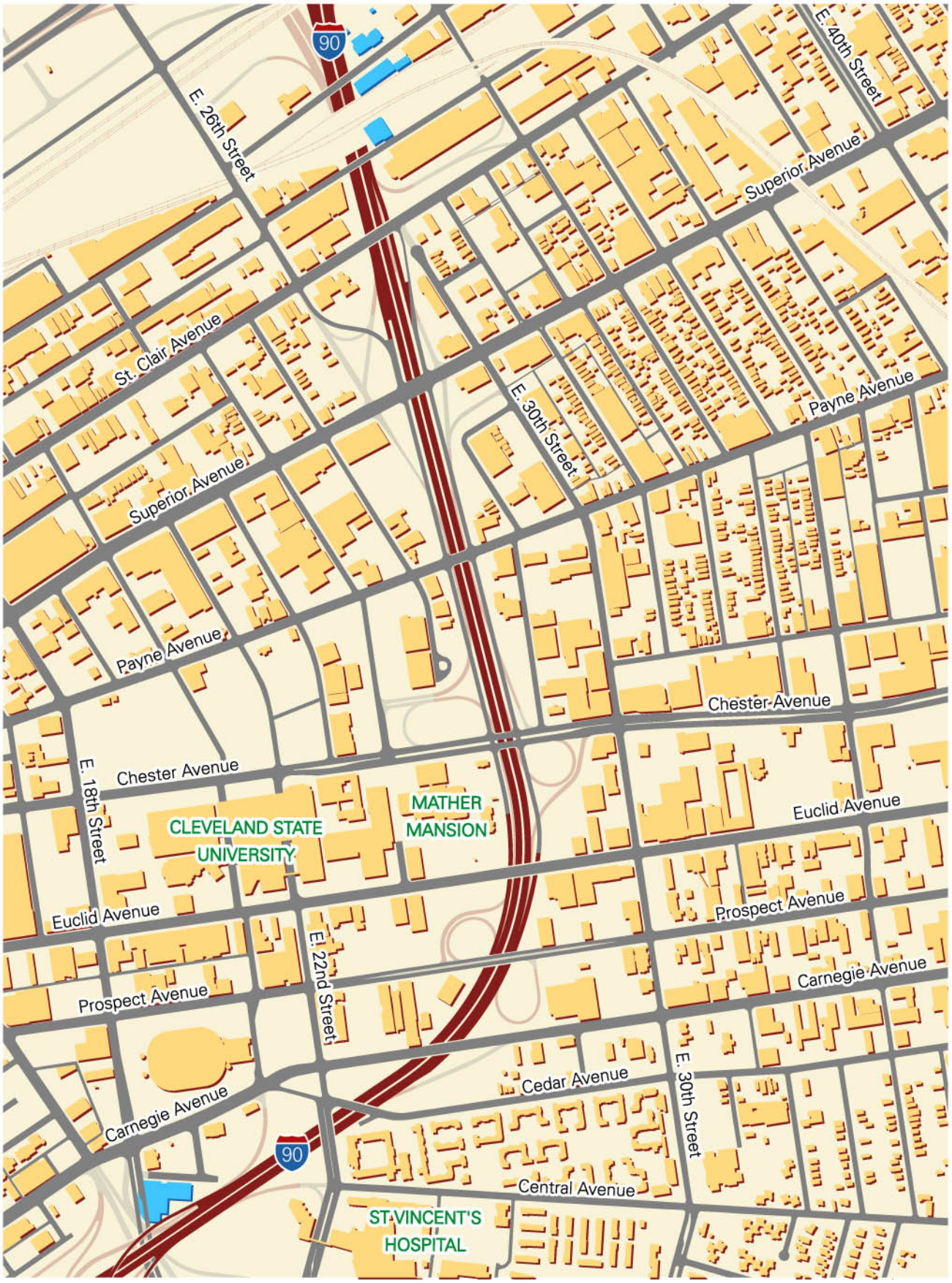
*Central Interchange and I-77/East 30th Street Interchange (October 9, 2003)* – The operational modeling of this component shows that the proposed reconfiguration of the existing Central Interchange and I-77/East 30th Street interchange, which incorporates a relocation of I-77 access and a complete reconstruction of the ramps accessing Ontario Street, East 9th Street and East 18th Street, has the greatest positive impact to the freeway system and to the city street grid. This improved operation coupled with the elimination of the design deficiencies associated with the existing Central Interchange will improve safety in the corridor. Thus, to improve the geometry, operation, and safety of the Central Interchange and I-77/East 30th Street interchange, this component is included as part of the Design Concept and Scope. The appropriate alignment of this configuration will be advanced once a decision regarding the Central Viaduct Bridge alignment is made.

***Innerbelt Trench***

The orientation of the interchanges along I-90, between the Central Interchange area and the Innerbelt Curve is such that drivers wanting to access the CBD often must take an indirect path once exiting the freeway to eventually travel towards the CBD. The number of interchanges and the confusion created from their orientation reduces their operational efficiency and makes them less appealing as choices for drivers, especially those not familiar with the area. This leaves the ramps of the Central Interchange area, particularly East 9th Street and Ontario Street, as the only clear access points to the CBD from I-90.

This alternative addresses this traffic flow issue by creating a frontage road system (Figures 2-7 to 2-10) from Chester Avenue north to St. Clair Avenue. This frontage road system consolidates direct access to the freeway, while maintaining access to all cross-streets within the area of the frontage road system. Direct access, entrance and exit, from the freeway to the frontage road system will be provided at Chester Avenue and Superior Avenue. The one-way frontage road pair that would parallel the freeway provides indirect access to all other cross-streets. The northbound frontage road is constructed on the east side of the Innerbelt Freeway and the southbound frontage road is constructed on the west side of the Innerbelt Freeway. The frontage road system resides at the same grade as the city street grid and intersects the existing street grid at all major cross-streets. This frontage road system also opens access to parcels fronting the Innerbelt in the trench area that were previously land-locked along with parcels vacated from the removal of the existing interchanges.

FIGURE 2-7: Frontage Roads

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# FIGURE 2-8: Trench Cross Sections

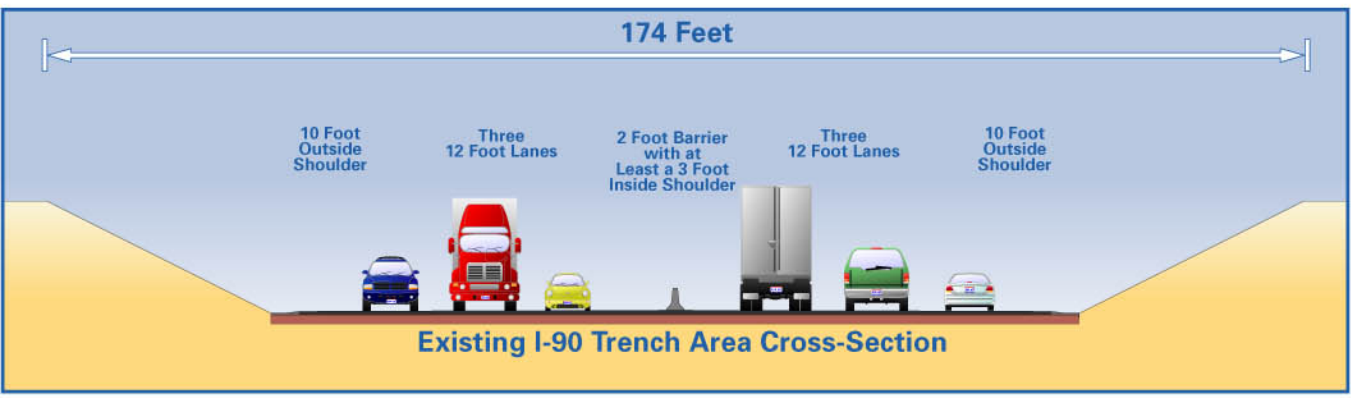



FIGURE 2-9: Existing Trench

FIGURE 2-10: Frontage Roads

The frontage road concept removes the existing interchanges at both Prospect Avenue and Carnegie Avenue. Access to these corridors would be provided through the reconfigured Central Interchange area via East 18th Street. Traffic may then move to and from the Prospect/Carnegie corridors via East 18th Street or the East 21st /22nd Street pair.

The frontage road system also opens the potential for freeway caps between East 22nd Street and Euclid Avenue, between Chester Avenue and Payne Avenue, and between Payne Avenue and Superior Avenue.

***Innerbelt Trench Summary***

*Innerbelt Trench (October 9, 2003)* – The design deficiencies, acceleration, deceleration, weave and terminal spacing lengths are inadequate and adversely affect the operational performance and safety of the Innerbelt Freeway. The ability to eliminate these design deficiencies, and thus the ability to improve the operational performance and safety of the Innerbelt Freeway, is a function of the service interchange spacing. Expressed another way, the current average service interchange spacing of one-quarter mile severely limits the potential to improve operational performance and safety.

The operational modeling of this component shows that the proposed reconfiguration of the Frontage Roads has a positive impact on operation. Further, with the elimination of the design deficiencies associated with the Innerbelt Trench, safety in the corridor will be improved. Thus, the Frontage Road component, to improve the geometry, operation and safety of the Innerbelt Trench, is part of the Design Concept and Scope.

***Innerbelt Curve***

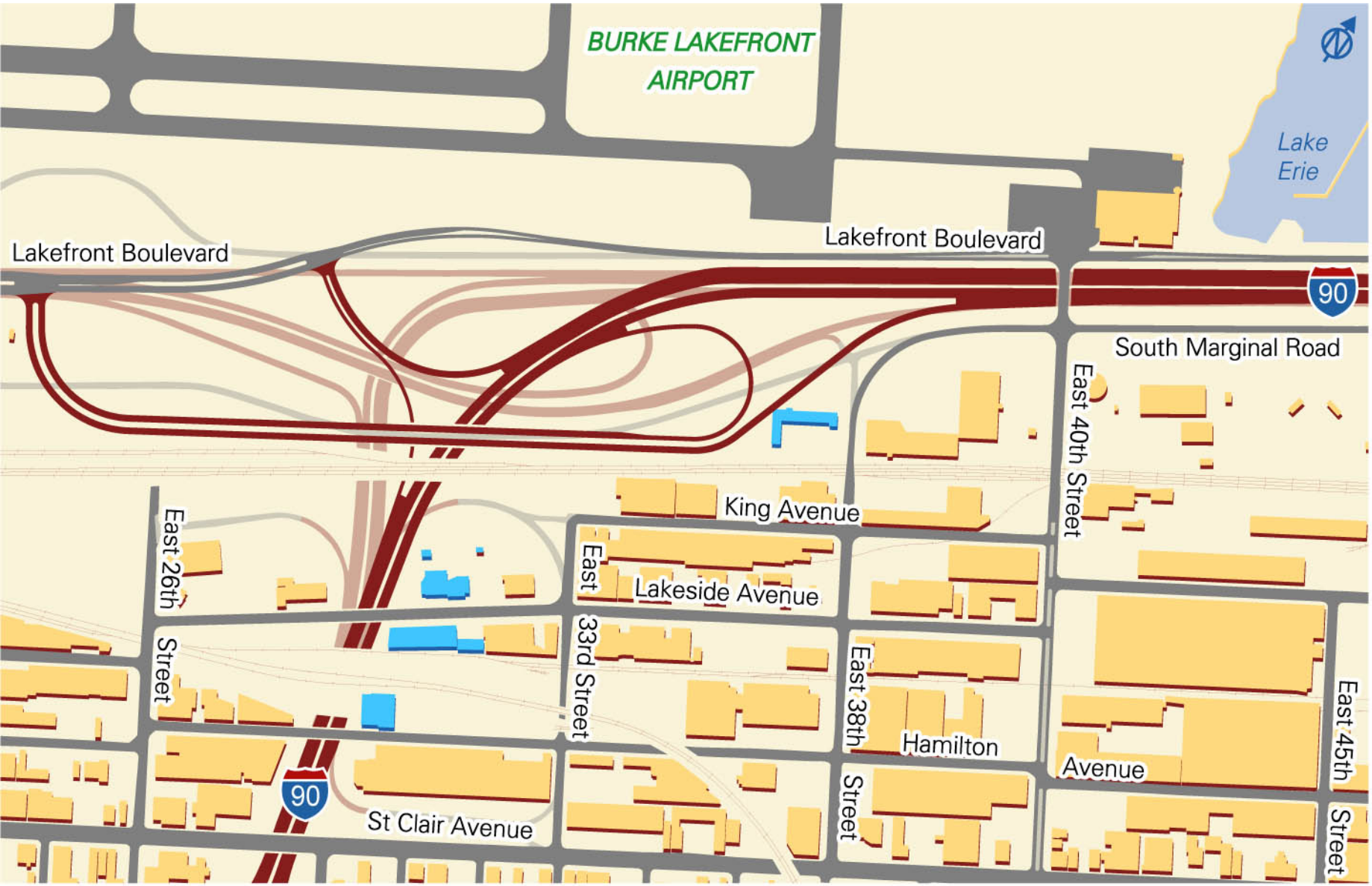
One of the four primary bottlenecks associated with the study area occurs in the Innerbelt Curve. The extreme geometry of the existing Innerbelt Curve causes both operational problems as motorists slow down in approach to the curve and safety problems. Further, under the current configuration, only two of the four westbound I-90 lanes continue through the curve, with the remaining lanes dropping to SR-2. To address this bottleneck, the Innerbelt Curve is "flattened" (Figure 2-11). Essentially, the curve radius is increased. As part of this proposed change, three through westbound lanes would continue through the curve and into the trench area.

Also, to improve operations, the existing entrance ramp from St. Clair Avenue to eastbound I-90, the existing exit ramp from eastbound I-90 to Lakeside Avenue, and the existing entrance ramp from Lakeside Avenue to westbound I-90 would be removed. Truck access to and from the Lakeside Industrial Area would be facilitated through the existing Superior Avenue and East 55th Street interchange and through a potential connection to the Lakefront Boulevard at East 40th Street.

***Innerbelt Curve Summary***

*Innerbelt Curve (September 11, 2003)* – The safety and operational impacts of the existing design of the Innerbelt Curve and the associated interchange of I-90 and SR-2 are severe. Further, the poor geometry and spacing associated with the Lakeside and St. Clair ramps further exacerbate these problems. The operational modeling of this component shows that

FIGURE 2-11: Innerbelt Curve



the proposed reconfiguration of the Innerbelt Curve has a positive impact on operation. Further, with the elimination of the design deficiencies associated with this curve, safety in the corridor will be improved. Thus, to improve geometry, operation, and safety, the Innerbelt Curve is included as part of the Design Concept and Scope.

***Priority Corridor System***

The City of Cleveland's CBD has no clear street system hierarchy in place. Typically, traffic should be collected on minor roadways, moved to larger roadways, and carried to the freeway. From smallest to largest, these roadways are: collector/distributor, minor arterial, major arterial, boulevard and freeway. The street grid should function much like a river and its tributaries.

The roadways identified as Priority Corridors (Figure 2-12) operate as described in the following:

*Ontario/Woodland corridor* – Ontario Street and Woodland Avenue act as one-way couplers east of the Innerbelt Freeway. Ontario Street is a two-way, major arterial west of the Innerbelt Freeway. This corridor runs from Public Square to East 55th Street.

*Superior corridor* – Superior Avenue is a two-way, major arterial. This corridor runs from Public Square to East 55th Street.

*Lakefront Boulevard/Parkway corridor* – The proposed Lakefront Boulevard/Parkway corridor is a two-way major arterial. This corridor runs from the Cuyahoga River east to the Innerbelt Curve.

*East 9th Street* – East 9th Street is two-way, major arterial. This corridor runs from the Ontario/Woodland corridor to the Cleveland Memorial Shoreway (Lakefront Boulevard/Parkway).

*East 18th Street* – East 18th Street is two-way, minor arterial. This proposed corridor runs from the Ontario/Woodland corridor to the Cleveland Memorial Shoreway.

*Carnegie Avenue* – Carnegie Avenue is a two-way, major arterial. This corridor runs from Ontario Street to East 30th Street.

*Frontage Road Corridor* – The proposed one-way frontage road pairs in the Innerbelt Trench area run from Chester Avenue north to St. Clair Avenue. Interchange with the Innerbelt Freeway is handled at Chester Avenue and Superior Avenue.

*Chester Avenue* – Chester Avenue is a two-way, major arterial. This corridor runs from East 9th Street to the interchange with the Innerbelt.

FIGURE 2-12: Priority Corridors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While it is beyond the scope of this project to address the complete lengths of these identified priority corridors, certain key intersections along these corridors have a direct impact on the function of the Innerbelt Freeway. These intersections have been identified based on modeling efforts in both the Conceptual and Hybrid Alternatives Phases of this study. The identified intersections are:

- West 3rd Street & Lakefront Boulevard*
- East 9th Street & Lakefront Boulevard*
- East 18th Street & Lakefront Boulevard*
- I-90 EB Ramp & Lakefront Boulevard*
- I-90 WB Ramp & Lakefront Boulevard*
- Ontario Street & Carnegie Avenue
- East 9th Street & Carnegie Avenue
- East 18th Street & Carnegie Avenue*
- East 9th Street & Ontario Avenue
- East 18th Street & Ontario Avenue*
- East 22nd Street & Orange Avenue
- East 30th Street & Orange Avenue
- East 22nd Street & Woodland Avenue
- Northbound I-77 Exit Ramp & Woodland Avenue
- Northbound Frontage Road & Superior Avenue*
- Northbound Frontage Road & Payne Avenue*
- Northbound Frontage Road & Chester Avenue*
- Southbound Frontage Road & Superior Avenue*
- Southbound Frontage Road & Payne Avenue*
- Southbound Frontage Road & Chester Avenue*.

Note: * Indicates proposed intersection.

A shift to a street system hierarchy should improve the flow of traffic on the Interstate highway by improving the interface of the highway with the city streets. If any of the modifications that consolidate access to the Innerbelt Freeway are implemented, the importance of hierarchy system becomes even greater to maintain traffic flow to and from the freeway. In the first phase of the priority corridor component, the key intersections along these corridors that directly impact the operation of the Innerbelt Freeway are to be addressed.

When the Arterial Management System component of the Intelligent Transportation System is implemented, identified priority corridors should be given preference for traffic movement during coordination of the arterial signal network. Further, initial incident detection equipment should focus on these corridors and key intersections along these corridors. The proposed hierarchy of priority corridors is:

1. East 9th Street Corridor
2. Ontario/Woodland Avenue Corridor
3. Frontage Roads Corridor

4. Superior Avenue Corridor
5. Lakefront Boulevard Corridor
6. Carnegie Avenue Corridor
7. Chester Avenue Corridor
8. East 18th Street Corridor

The final element of the priority corridor concept is that as each corridor is improved over time, as part of maintenance projects or reconstruction, it is strongly recommended that the changes reflect the overall importance of the corridor for moving traffic in the CBD. An example of this is the East 18th Street corridor. Even with the proposed improved connectivity to the freeway in the northern and southern portions of this corridor, as part of this study via the Central Interchange and Lakefront Boulevard components, the changes do not address the complete corridor. There are several locations along East 18th Street where the street slightly changes alignment (zigzags) from block to block. As future improvements are made to East 18th Street the alignment should be straightened.

***Priority Corridor System Summary***

*Priority Corridors (October 9, 2003)* – Approximately 85 percent of the traffic using the Innerbelt Freeway has a destination within the study area during the AM peak period or an origin within the study area during the PM peak period. Because of this unique travel pattern, the interrelationship and connection between the city street grid and the Innerbelt Freeway becomes even more crucial. This interrelationship is further strengthened as existing access points to and from the freeway are consolidated in the Innerbelt Trench and the Central Interchange. To effectively move traffic to and from the Innerbelt Freeway and to improve safety, a system of priority corridors should be identified. Arterial signal coordination should reflect this hierarchy and key intersections along these corridors should be improved to compliment changes done to the Innerbelt Freeway. Thus, the Priority Corridor component is included as part of the Design Concept and Scope.

***Reconstruct CSX Railway Bridge***

The existing system provides I-90 access to and from Lakeside Industrial Area via the Superior Avenue, St. Clair Avenue, Lakeside Avenue, and East 55th Street ramps. The Innerbelt Curve improvements require the removal of the Lakeside Avenue and St. Clair Avenue ramps, which are the central access points to the district. The Superior Avenue interchange is improved, in part to maintain adequate access to Lakeside Industrial Area from the west.

To maintain adequate access from the east and improve traffic capacity to the Lakeside Industrial Area from the East 55th Street interchange, the roadway narrowing of East 55th Street from four lanes to two lanes beneath the existing CSX railroad bridge should be improved. The removal of the roadway "pinch" along East 55th Street, by providing two lanes in each direction, is included as part of the Design Concept and Scope.

In addition to providing a long-term benefit to the area, the reconstruction of the CSX railway bridge will provide short-term relief. The flattening of the Innerbelt Curve is scheduled to be one of the first components to be constructed. Because of this, the removal

of the East 55th Street narrowing will be used as a maintenance-of-traffic measure to improve the flow of traffic through the East 55th Street corridor during the construction period of the improved Innerbelt Curve.

***Intelligent Transportation System (ITS)***

The Intelligent Transportation System (ITS) component proposed for the Cleveland Metropolitan Area includes freeway system elements (Freeway Management System or FMS) and surface street elements (Arterial Management System or AMS) that are integrated into a comprehensive metropolitan traffic management system. Further, the ITS component would include a maintenance of access/maintenance of traffic (MOA/MOT) component.

The ITS would consist of core functions that address:

- Incident Detection
- Verification/Traffic Monitoring and Surveillance
- Traveler Information
- Weather Detection and Information
- Traffic Data Management
- Maintenance and Construction Management
- Arterial Signal Optimization.

See the *Cleveland Freeway Management System Detailed Project Plan*, completed in January 2004, concerning the FMS.

*Arterial Management System* – Since 85 percent of all traffic utilizing the corridor during the AM peak period has a destination within the study area and vice versa in the PM peak, the management of the operation of the arterial street network is as important as the management of the freeway network. As such, an Arterial Management System is essential for the efficient operation of the corridor transportation network.

The backbone of the system would be a TMC to coordinate the various elements of the AMS. This proposed TMC would be located at the City of Cleveland and staffed with City personnel.

The second element of the AMS includes active traffic controls. This would focus on a dynamic system of coordinated signals. At a minimum, the CBD signals and key feeder arterials would be part of this system. The staff of the TMC would initiate various signal strategies to respond to incidents on either the freeway or arterial street system to more efficiently react to and clear the incident. Further, as the AMS progressed and additional instrumentation was added, a dynamic signal control system could be implemented.

*MOA/MOT* – During the construction period for the components of the Recommended Alternative, the ability to more closely monitor and manage incidents within the construction segments and along the approaches to the construction segments will be an important part of the overall MOA/MOT strategy. Further, close monitoring of construction segments may have a positive impact on work zone safety. As such, a package of additional portable

devices will be identified to help manage this construction period. These devices will include portable DMS, temporary camera mounts and additional communication hardware.

Additional incident management strategies for the construction period would also be developed as part of this component. This includes the potential use of dedicated service personnel during peak periods to respond to and clear incidents in congested construction zones more efficiently.

Beyond the upfront cost of an ITS deployment, an annual cost is associated with the ongoing operation and maintenance of the system. Operations and maintenance requires funding for the TMC physical plants, management staffs, operators, information technology specialists, engineers, maintenance staffs, highway response staffs, etc. In addition, these annual costs also include vehicles, computers, communication equipment, and highway equipment maintenance and replacement costs. These costs can be substantial over time, however, ITS has clearly shown a net savings when all benefits of the system are factored. Thus, the Freeway Management System, Arterial Management System and MOA/MOT System components of the ITS are included as part of the Design Concept and Scope.

***Public Transit Improvements for the Innerbelt Corridor***

***Express Bus Service*** – A number of new routes and service level increases to existing routes in the Innerbelt corridor were analyzed throughout the study. These are summarized in Table 2.1. The proposed service improvements are increases in weekday peak period-peak direction trips for all but one of the routes listed. The estimate of service increase was based on an estimate of the number of additional trips needed to achieve the peak period headway improvement, the route's running time, and a deadhead time factor.

These service improvements represent approximately a 28 percent increase over existing service levels on these routes. The travel demand forecasting results indicate that these service improvements will result in approximately a 20 percent ridership increase, reducing peak hour vehicle trips in the corridor by about 2050 trips per day.

**Table 2.1 Proposed Transit Service Improvements**

| Route | Area Served | Service Improvement | Current Vehicle Hours | Vehicle Hour Increase | Vehicle Increase |
|---|---|---|---|---|---|
| 51F | Strongsville | increase peak headway to 8 minutes | 19.3 | 10.0 | 3 |
| 251 | Strongsville | increase peak headway to 15 minutes | 12.0 | 5.0 | 1 |
| 55CX | Westlake | increase in mid-day service | 40.6 | 12.0 | --- |
| 246 | Westlake | increase peak headway to 5 minutes | 19.5 | 10.7 | 3 |
| 22 | Linndale | increase peak headway to 5 minutes | 169.6 | 45.0 | 7 |
| 86F | Berea | increase peak headway to 10 minutes | 6.2 | 15.0 | 4 |
| 79/79X | Parma | increase peak headway to 5 minutes | 123.5 | 15.0 | 4 |
| 51X | Middleburg Heights | increase peak headways to 10 minutes | 93.4 | 15.0 | 4 |
| 35F/135 | Pleasant Valley | increase peak headways to 8 minutes | 17.9 | 12.5 | 3 |
| Total | | | 502 | 140.2 | 29 |

North Olmsted Park-n-Ride Expansion – The existing North Olmsted Park-and-Ride lot currently has 310 spaces and is running at approximately 83 percent occupancy. It is serviced by GCRTA Route 263. The data indicates that the increase in service recommended for Route 263 would result in ridership increases exceeding the current capacity of the lot. Further analysis in the environmental phase is warranted, but indications are the lot should be expanded by approximately 100 spaces in conjunction with the service increase.

Strongsville Park-n-Ride Expansion – This is located in southern Cuyahoga County where there has been recent residential growth. A Park-and-Ride lot currently exists within the Ohio Turnpike interchange at Pearl Road. It has 388 spaces and a daily usage of 331, according to the NOACA usage survey. This Park-and-Ride lot is also well suited to serve the downtown Cleveland commuters in the I-71 travel corridor. Again, given a projected 20 percent increase in daily ridership, the lot should be expanded by approximately 150 spaces, if increased service is implemented.

Westlake Park-n-Ride Expansion – The I-90 travel corridor west of Cleveland would be served by the expansion of Park-and-Ride facilities at, or in the vicinity of, the current Westlake Park-and-Ride lot. This location is near population centers in western Cuyahoga County that comprise a prime downtown Cleveland commuter market. The current Westlake Park-and-Ride lot has 562 spaces, of which 461 are being used daily, according to a NOACA usage survey. Being near capacity, this will need to be expanded in order to accommodate the service increases being recommended for the routes being served by this Park-and-Ride. Given space constraints at this site, another Park-and-Ride lot may need to be developed in this area. Given the projected ridership increase, it is recommended that another 200 spaces be provided in this area if service levels are increased.

Public Transit Improvements for the Innerbelt Corridor Summary
Public Transit Improvements for the Innerbelt Corridor (December 11, 2003) & Public Transit Improvements for the Innerbelt Corridor Addendum (January 8, 2004) – With the addition of express bus service, improvements to the North Olmsted, Strongsville, and Westlake Park-n-Ride lots will need to be undertaken.

### 2.2.1.3 Innerbelt Cost Estimate

The cost estimate for the Innerbelt (Table 2.2) is calculated using 2002 dollars and is based on several assumptions. Preliminary and Final Development Phase costs are assumed to be twelve-percent of the construction cost. Contract Administration and Inspection are assumed to be ten-percent of the construction cost. Contingencies are assumed to be thirty-percent of the construction cost. The sum of those values gives the begin range of the total costs. The end range include an additional five-percent to twenty-percent, depending on the stability of the component.

## Table 2.2 Innerbelt Project Capital Cost Estimate (2002 Dollars)

| Fiscal Year | | Construction | PDP/FDP | Contract Administration & Inspection | Right of Way Acquisition | Contingencies | Total Project Costs Begin Range | Total Project Costs End Range |
|---|---|---|---|---|---|---|---|---|
| 2007 | E 55th St. Railroad Bridge Reconstruction | $4,508,000 | $540,960 | $450,800 | $250,000 | $1,352,400 | **$7,102,160** | **$7,457,268** |
| 2007 | Quigley Road Connector | $6,224,400 | $746,928 | $622,440 | $2,000,000 | $1,867,320 | **$11,461,088** | **$12,034,142** |
| 2008 | Innerbelt Curve - Including Marginal Road Ramps and E. 40th Street over I-90 | $74,329,400 | $8,919,528 | $7,432,940 | $7,000,000 | $22,298,820 | **$119,980,688** | **$125,979,722** |
| 2011 | Central Viaduct Bridge Widening and Approaches Rehab (Lanes & Shoulders) | $150,735,600 | $18,088,272 | $15,073,560 | $1,000,000 | $45,220,680 | **$230,118,112** | **$241,624,018** |
| 2012 | Hospital Curve Widening & Pavement Rehabiltiation | $34,609,100 | $4,153,092 | $3,460,910 | $0 | $10,382,730 | **$52,605,832** | **$55,236,124** |
| 2012 | Fulton Road to W 25th St. Pavement Rehabilitation/CD Road Reconstruction | $19,270,000 | $2,312,400 | $1,927,000 | $0 | $5,781,000 | **$29,290,400** | **$30,754,920** |
| 2013 | I-77 Continuous Flow | $22,051,500 | $2,646,180 | $2,205,150 | $500,000 | $6,615,450 | **$34,018,280** | **$35,719,194** |
| 2014 | Central Interchange | $59,419,940 | $7,130,393 | $5,941,994 | $5,000,000 | $17,825,982 | **$95,318,309** | **$100,084,224** |
| 2015 | Trench Area Pavement Widening & Frontage Roads | $52,075,000 | $6,249,000 | $5,207,500 | $6,000,000 | $15,622,500 | **$85,154,000** | **$89,411,700** |
| | ***HIGHWAY SUB-TOTAL*** | **$423,222,940** | **$50,786,753** | **$42,322,294** | **$21,750,000** | **$126,966,882** | **$665,048,869** | **$698,301,312** |
| | Euclid Park and Ride** | $145,000 | $17,400 | $14,500 | $0 | $43,500 | **$220,400** | **$231,420** |
| | North Olmsted Park and Ride | $200,000 | $35,000 | $20,000 | $300,000 | $60,000 | **$615,000** | **$645,750** |
| | Strongsville Park and Ride | $550,000 | $66,000 | $66,000 | $0 | $110,000 | **$792,000** | **$831,600** |
| | Westlake Park and Ride | $2,125,000 | $255,000 | $255,000 | $0 | $425,000 | **$3,060,000** | **$3,213,000** |
| | Puritis & Triskett Park Minor Access Improvements | $1,000,000 | $120,000 | $120,000 | $250,000 | $300,000 | **$1,790,000** | **$1,969,000** |
| | ***TRANSIT SUB-TOTAL*** | **$4,020,000** | **$493,400** | **$475,500** | **$550,000** | **$938,500** | **$6,477,400** | **$6,890,770** |
| | ***CLEVELAND ARTERIAL MANAGEMENT SYSTEM*** | **$3,290,000** | **$394,800** | **$329,000** | **$0** | **$987,000** | **$5,000,800** | **$5,375,860** |
| | **TOTAL** | **$430,532,940** | **$51,674,953** | **$43,126,794** | **$22,300,000** | **$128,892,382** | **$676,527,069** | **$710,567,942** |

**Estimate for Sinage Only

### 2.2.2 Cuyahoga River Valley Intermodal Connector (CRVIC) Project

#### 2.2.2.1 CRVIC Logical Termini

The Flats area occupies the Cuyahoga River Valley immediately west of downtown. In general, the Flats occupy the entire width of the Cuyahoga River Valley, from the mouth of the Cuyahoga River at Lake Erie to the Central Viaduct Bridge. South of the Central Viaduct Bridge, the Cuyahoga River Valley is known as the Industrial Valley. The Flats area continues to serve the region as an intermodal center, providing facilities for the transfer of bulk materials (primarily aggregates, cements and iron ore pellets) between waterborne and surface transportation modes. Though these intermodal facilities are dispersed along almost the entire length of the navigable portion of the Cuyahoga River, there is a particularly dense concentration near the mouth of the river, near the area known as Whiskey Island.

The Eagle Avenue Viaduct Study, formerly called the Flats Transportation Study, has indicated that there is a need to create an Intermodal Connector (Figure 2-13) in order to route trucks from the Flats and Port areas to the freeway system without using the local, residential street system. There is special concern over truck traffic in the Tremont and Ohio City neighborhoods using local, residential streets to reach the Interstates. These trucks cause noise and vibration problems for the local residents. The resolution to the problem would remove the trucks from the Tremont and Ohio City neighborhoods, as well as create an improved truck route that would encourage truck drivers to stay away from residential areas. Thus, the logical termini are the Flats and Port areas in the Industrial Valley at one end and the freeway, at the other end.

#### 2.2.2.2 CRVIC Description

The Intermodal Connector is comprised of six key segments: a reconfigured West 7$^{th}$ Street/I-490 interchange, a Quigley Road Connector, a West Bank Connector, a connection up Commercial Road hill into the Central Interchange, an East Bank Connector, and the Jennings Road extension. This creates a transportation spine in the Industrial Valley along Quigley Road and West 3rd Street to which all circulator roadways can connect.

The first key segment reconfigures the West 7$^{th}$ Street/I-490 interchange as a full interchange to provide access to the Interstate in all directions. The current West 7$^{th}$ Street/I-490 interchange only provides westbound exit and eastbound entrance movements to the Interstate. Trucks entering and exiting the Flats area, due to its direct connection to Quigley Road, heavily use this interchange. Since the interchange does not currently provide for trucks wishing to head south on I-71 or west on I-90, the trucks continue on Quigley Road to Clark Avenue and through the Tremont neighborhood.

The second key segment deals with the Quigley Road Connector. As part of the Quigley Road Connector, West 3$^{rd}$ Street and Quigley Road are completely reconstructed from the Cuyahoga River to the south, with new pavement, curbing, drainage, signing and lighting. This improved segment of West 3$^{rd}$ Street and Quigley Road becomes the transportation spine for the Flats and Industrial Valley. All connections to and from the Interstate freeways and collector/circulator roadways will be made with this spine.

FIGURE 2-13: CRVIC


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The connector begins where Quigley Road intersects Holmden Avenue and continues along the ISG property and up the hillside to the West 14th Street interchange with I-71 and S.R.176. The connector cuts into the hillside and requires a six percent grade to reach the top of the hill. The proposed roadway requires the property take of an industrial welding shop at its termini at West 14th Street. The existing intersection of West 14th Street and the I-71/SR-76 northbound interchange off-ramps is reconfigured. A four leg signalized intersection is created.

The new transportation spine would then be connected to either the existing circulation roadway system in the Flats area and/or to a new West Bank Connector. The proposed West Bank Connector would serve as a connector roadway between the port facility on the lakefront, the Quigley/West 3rd Street spine and the Interstates.

A further segment is a new connection up Commercial Road Hill into the Central Interchange area. This Commercial Road Hill connection would provide improved access between the CBD and the Flats/Industrial Valley. This connection is being analyzed in detail by the Eagle Avenue Viaduct Study.

The next segment deals with the East Bank Connector. This is accomplished by constructing a new, low-level lift bridge connection just north of Jefferson Avenue. The section of Broadway from this new river crossing to I-77 would be improved. This new river crossing would provide a low-level link between the west and east bank of the Industrial Valley. In addition to or in place of the new, low-level lift bridge, a roadway between West 3rd Street just north of the Cuyahoga River and Broadway on the east bank of the Industrial Valley is being considered. This new connection follows the riverbank and crosses the Cuyahoga Valley Scenic Railroad via an at-grade crossing.

Further, the existing connection between Quigley Road and Jennings Road would be improved and opened for public use. This segment is referred to as the Jennings Road extension.

### 2.2.2.3 CRVIC Summary

*Cuyahoga River Valley Consolidated Intermodal Connector (December 11, 2003), Cuyahoga River Valley Consolidated Intermodal Connector (CRVCIC) Addendum* (January 8, 2004), & *Cuyahoga River Valley Consolidated Intermodal Connector (CRVCIC) Addendum II* (February 12, 2004) – The following components are included in the Design Concept and Scope:

***West 7th Street Interchange Improvements*** – The analysis tested modifications to the West 7th interchange with I-490. It was found that this interchange does not appear to benefit regional transportation as indicated by fewer than 100 total vehicles using either new ramp. Vehicles desiring to get south and west from the area are exiting the CRVIC to enter the Interstate system at other locations, with much of this traffic using the connections up into the Central Interchange to access the Ontario and East 18th Street ramps. However, this modification does provide a consolidated access point into the Flats and Industrial Valley area. There may be potential economic impacts from this consolidation of access, which would be quantified in the environmental phase of the analysis.

***Quigley Road Connector*** – The Quigley Road Connector performs well in both alternatives, drawing approximately 1,050 trucks on a daily basis. Adding the segment takes some of the traffic from Clark Road, but more importantly, it completes the transportation spine so that trucks have direct access to I-71 instead of making the turns from Clark to West 14th Street.

***West Bank Connector*** – The new connector roadway between River Road and West 3rd Street would carry approximately 4,200 trucks per day under both of the tested scenarios. Trucks using the connector road primarily need to make their way back to the Interstate system and prefer to use a faster roadway alternative for trips to the south and east of Cleveland. The trucks attracted to the connector are presently using other roadways in the system. Some of these roadways, coupled with land development/redevelopment, present conflicts between the large trucks and emerging neighborhoods along the Flats area. An Economic analysis, will need to discern what the direct and indirect benefits are from building this roadway compared with "doing nothing".

***East Bank Connector*** – While river crossings come at a premium, this one provides for some of the truck movements in the system but not as many as initially anticipated. With only 1,378 trucks and 5,022 other vehicles using the crossing per day, the benefits to the existing transportation network are minimal. At an approximate cost of $34.5 million (2002 dollars, not including operating costs) to build a new bridge in this location, this segment does provide a new low-level crossing between the east and west bank of the Industrial Valley. This new crossing, coupled with the improved Interstate access represented by other components of the CRVIC, may improve redevelopment opportunities on the east bank of the Industrial Valley.

***Jennings Road Extension*** – Analysis of this extension shows that only 700 trucks would use this roadway. It is evident from the traffic assignment plots that there is more demand for the West 14th Street Interchange with I-71 and it appears sufficient for handling existing and forecast traffic. Without the extension, CRVIC Configuration #1 shows that the trucks are using the West 14th Street interchange. This extension does not appear to be a solution to the transportation problems currently experienced in the study area. However, this segment does provide direct access to the west bank ISG site. Redevelopment of this site may benefit from this increased access.

The transportation analysis shows that some segments of the CRVIC attract a significant number of trucks and benefit the regional transportation system. The analysis indicates two of the segments should proceed to further development based upon this transportation analysis. Candidates for continued study based on regional transportation impacts alone include the West Bank Connector and the Quigley Road Connector, as these segments demonstrate system-wide benefits. Further, access from the Flats to the Central Interchange area also shows a strong transportation network benefit. However, the Eagle Avenue Viaduct Study will determine configuration of this access.

The performance of the East Bank Connector, the expanded West 7th Street Interchange at I-490, and the Jennings Road Extension showed little impact on regional transportation. However, the economic impact of these segments, when coupled with those CRVIC

segments that impact regional transportation, may justify their inclusion in a regional strategic plan. The consolidated access represented by the improvements to the I-490/West 7th Street interchange, the low-level connection of the east and west banks of the Industrial Valley represented by the East Bank Connector and the Jennings Road Extension access through the west ISG site may provide the critical access necessary to redevelop large sections of the Industrial Valley. As such, these segments should be carried forward for further analysis to determine their economic impacts.

#### 2.2.2.4 CRVIC Estimate

The cost estimate for the CRVIC (Table 2.3) is calculated using 2002 dollars and is based on several assumptions. Preliminary and Final Development Phase costs are assumed to be twelve-percent of the construction cost. Contract Administration and Inspection are assumed to be ten-percent of the construction cost. Contingencies are assumed to be thirty-percent of the construction cost. The sum of those values gives the begin range of the total costs. The end range include an additional five-percent to twenty-percent, depending on the stability of the component.

**Table 2.3 CRVIC Project Capital Cost Estimate (2002 Dollars)**

| Fiscal Year | | Construction | PDP/FDP | Contract Administration & Inspection | Right of Way Acquisition | Contingencies | Total Project Costs Begin Range | Total Project Costs End Range |
|---|---|---|---|---|---|---|---|---|
| 2011 | CRVIC | $27,311,170 | $2,681,912 | $3,277,340 | $8,000,000 | $8,193,351 | **$49,463,773** | **$59,356,528** |
| 2011 | New River Crossing | $21,360,000 | $2,563,200 | $2,136,000 | $1,000,000 | $6,408,000 | **$33,467,200** | **$35,140,560** |
| | **TOTAL** | **$48,671,170** | **$5,245,112** | **$5,413,340** | **$9,000,000** | **$14,601,351** | **$82,930,973** | **$94,497,088** |

### 2.2.3 University Circle Access Boulevard (UCAB) Project

#### 2.2.3.1 UCAB Logical Termini

The University Circle area is located 4 miles east of the Central Business District (CBD). It is roughly bounded by Wade Park Avenue on the north, Stokes Boulevard and Cedar Glen Parkway on the south, Ansel Road on the west, and Little Italy and the GCRTA's Red Line on the east. The University Circle Access Boulevard is new construction, providing access to this area. Thus, the University Circle area is the destination and the eastern logical terminus.

A portion of the traffic that currently travels the Innerbelt Freeway is traffic destined for the University Circle area. Currently, there is not a good, direct connection to the University Circle area from points to the west and south. Access between the Innerbelt Freeway and the University Circle area is currently provided at the following interchanges:

*I-90 and Carnegie Avenue/Prospect Avenue* – For the purpose of this discussion, the two partial interchanges located at Carnegie and Prospect Avenues will be considered as a single

interchange. This is a pair of partial interchanges that provide full access between the Innerbelt Corridor and the University Circle area.

*I-90 and Chester Avenue* – This interchange provides full access between I-90 and the University Circle area.

Thus, traffic travels along the Innerbelt Freeway to either the Carnegie Avenue/Prospect Avenue or Chester Avenue interchanges and then proceeds towards University Circle. This traffic must travel through as many as three of the four primary bottlenecks that exist along the Innerbelt Freeway.

No University Circle access problems associated with this pair of interchanges have been identified; however, commuters have questioned the original design that requires them to travel through the most heavily congested portions of the regional freeway system in order to access University Circle.

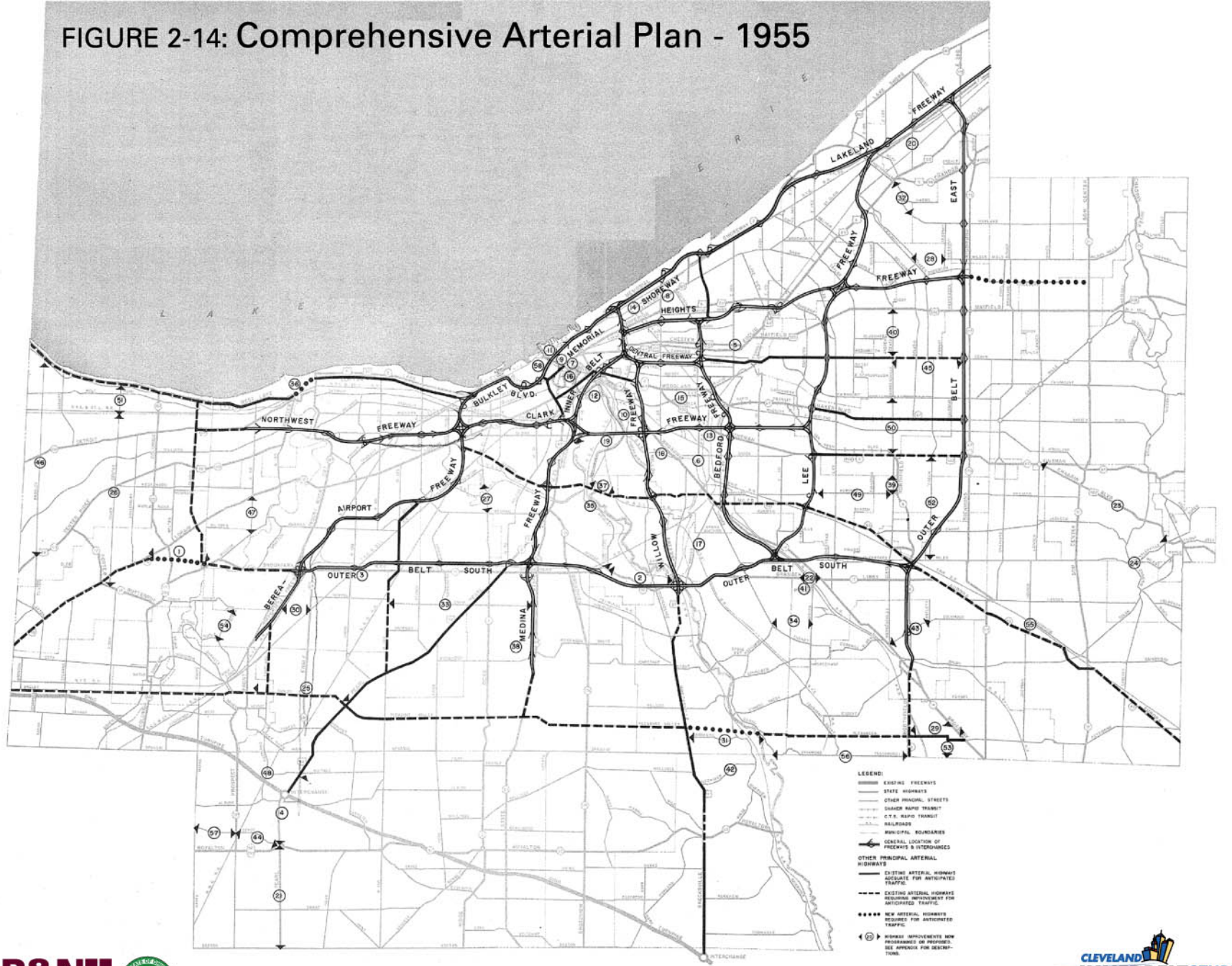
To obtain the project goal of relieving traffic pressure from the Innerbelt via a new roadway, a connection point to the existing freeway network would be needed that was attractive to motorists and cause the least amount of property impacts. The existing I-77/I-490 interchange provides a natural starting point, at the eastern stub of I-490. The eastern side of the interchange (I-490 stub) ends as an intersection with East 55$^{th}$ Street, a local arterial. The *Comprehensive Arterial Plan* of 1955 (Figure 2-14) and the *Recommended Cuyahoga County Freeway System - 1957* (Figure 2-15) originally had a freeway, the current day I-490, continuing through this interchange and connecting to the East Outerbelt, today's I-271. A continuation of the freeway was approached early in the Cleveland Innerbelt Study, but a new freeway was not well received by the public. Through public involvement, a boulevard beginning at the I-490 stub evolved and received public support. With the stub of I-490 available and a nearby, vertically depressed rail corridor available, to minimize property impacts, the western terminus and general corridor were established.

### 2.2.3.2 UCAB Description

A portion of the traffic that currently travels the Innerbelt Freeway is traffic destined for the University Circle area. Currently, there is no good direct connection to the University Circle area from points to the west and south. Thus, traffic travels along the Innerbelt Freeway to either the Carnegie Avenue or Chester Avenue interchanges and then out to University Circle. This traffic must travel through, as many as three of the four primary bottlenecks that exist along the Innerbelt Freeway.

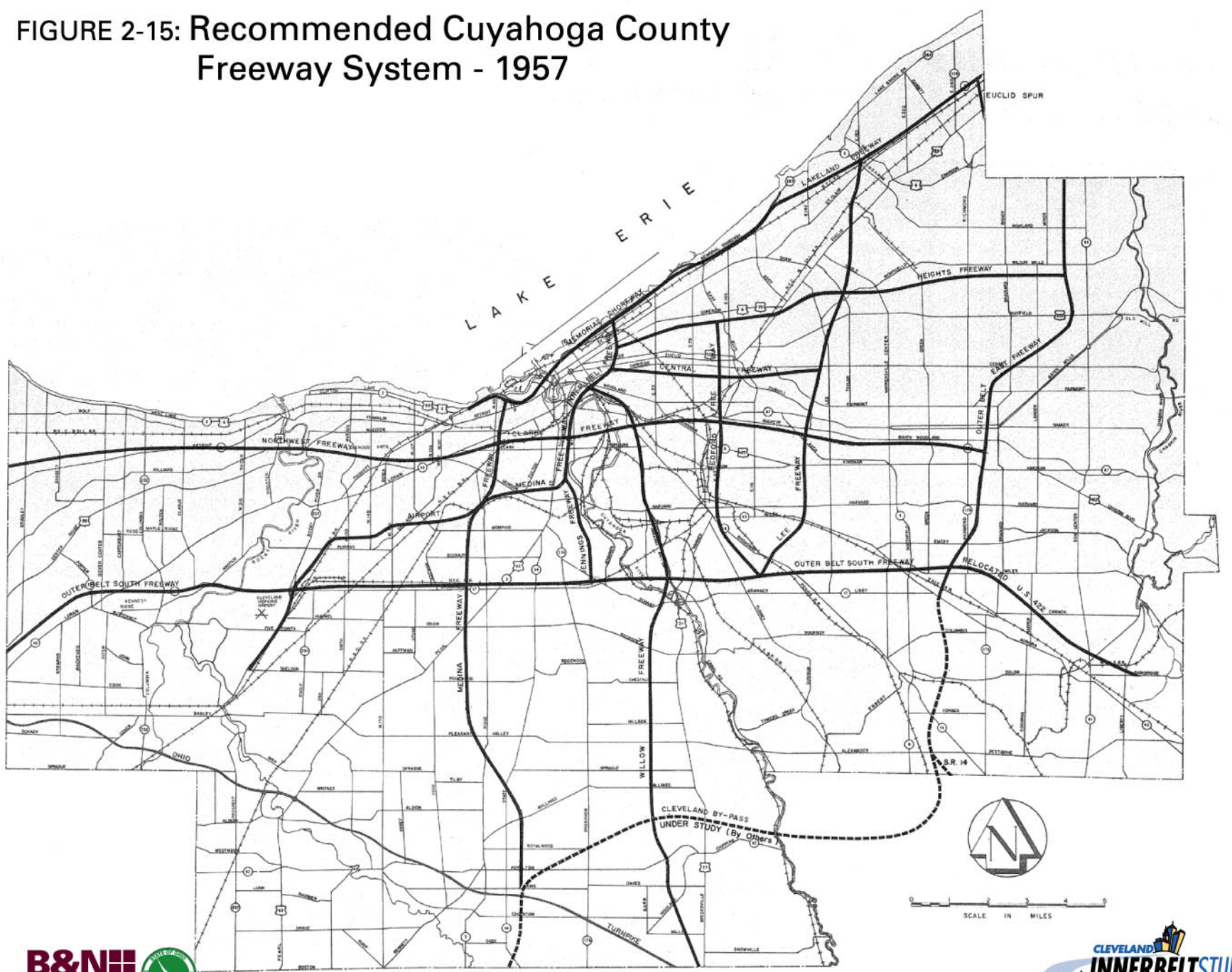
The goal of the University Circle Access Boulevard (Figure 2-16) is to provide direct access between the freeway system and University Circle to relieve traffic pressure on the Innerbelt Freeway. This new boulevard also provides direct access to/from several east side neighborhoods, first-ring suburbs, the University Circle District and the existing freeway network.

# FIGURE 2-14: Comprehensive Arterial Plan - 1955



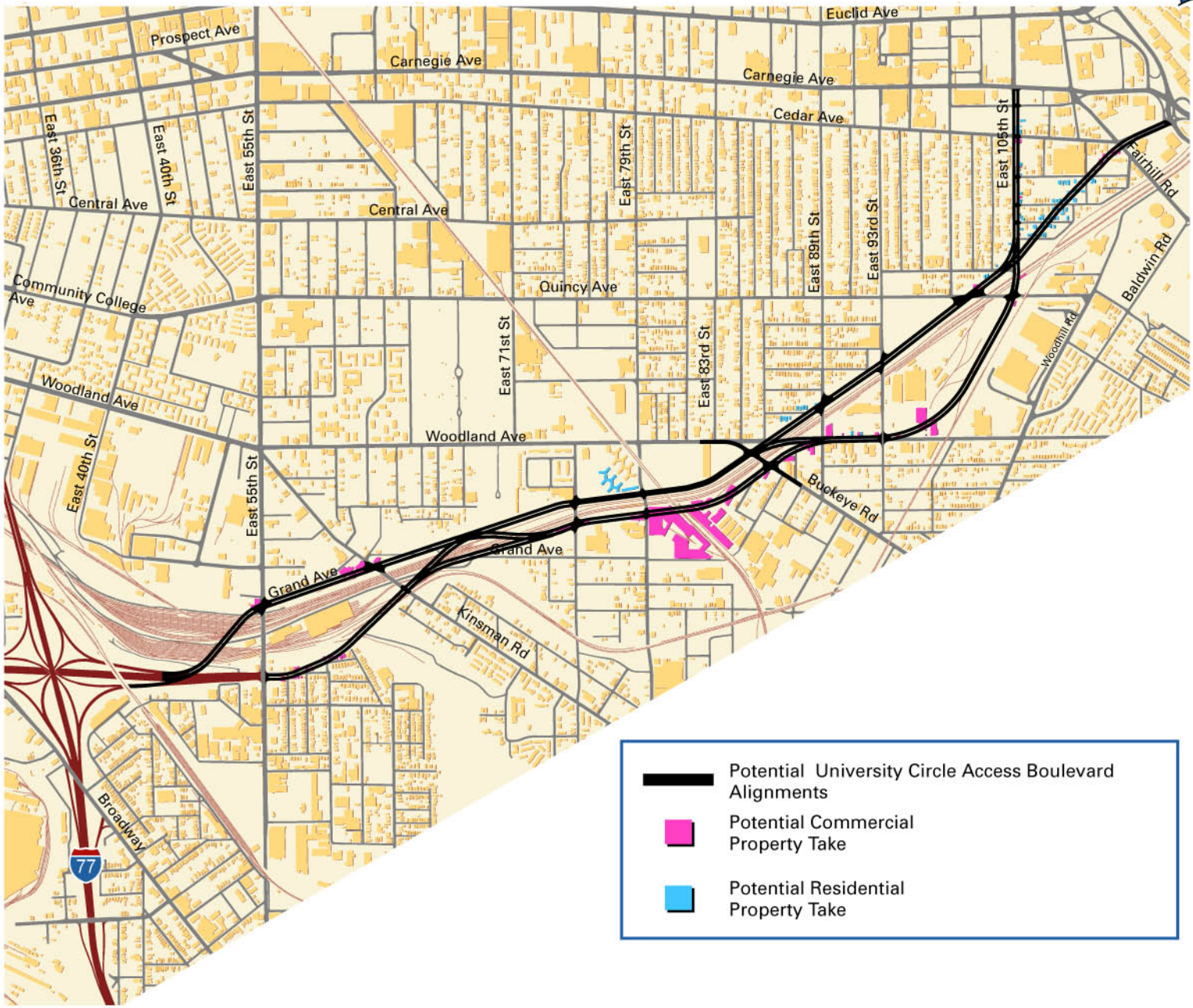

Source: "Comprehensive Arterial Highway Plan, Cuyahoga County - Ohio," Board of County Commissioners, Cuyahoga County, Ohio, 1955

# FIGURE 2-15: Recommended Cuyahoga County Freeway System - 1957




Source: "Corridor Report for Interstate and Alternate Routes in the Cuyahoga County Freeway System," Cuyahoga County Engineer, 1957

# FIGURE 2-16: University Circle Boulevard



The proposed boulevard would be a six-lane city street facility with a median. It would begin near the existing intersection of I-490 and East 55th Street. The boulevard would then follow the existing railroad right-of-way (Norfolk-Southern, CSX, and the Greater Cleveland Regional Transit Authority) to East 105th Street in the University Circle area. The boulevard would then either continue up East 105th Street to Carnegie Avenue or would connect to existing Martin Luther King Drive. Possible intersection locations for this new boulevard include: East 55th Street, Kinsman Road (U.S. 422), East 75th Street, East 79th Street, Buckeye Road, East 89th Street, East 93rd Street, Quincy Avenue and Carnegie Avenue.

### 2.2.3.3 UCAB Summary

*University Circle Access Boulevard (UCAB) (October 9, 2003)* – The operational modeling of this component shows that the proposed construction of the University Circle Access Boulevard has a positive impact on operation. Cut-through traffic along West 14th Street is notably reduced when the UCAB is added. Further, the addition of the UCAB reduces traffic through three of the four primary bottlenecks within the Innerbelt study area. Improved mainline freeway operation and reduction of vehicles utilizing the three primary bottlenecks will result in improved safety within the Innerbelt Freeway corridor. From an operational and safety standpoint, the UCAB has a positive impact on the Innerbelt Freeway and is recommended for inclusion in the Recommended Alternative. However, this recommendation must be contingent on positive results from the economical impact study of the UCAB, as it does have the largest number of potential Right-of-Way takes of any component considered. An additional benefit of the UCAB is a reduction in cut-through traffic in the Tremont neighborhood.

The UCAB can be constructed separate from the Innerbelt Project and the Cuyahoga River Valley Intermodal Connector Project. The UCAB does not physically connect to the Innerbelt or the CRVIC, nor are the Innerbelt and CRVIC needed to allow the UCAB to properly operate. The I-490 stub exists today, as does the rail corridor, and several connection points in the University Circle area. Thus, the UCAB has independent utility.

### 2.2.3.4 UCAB Cost Estimate

The cost estimate for the UCAB (Table 2.4) is calculated using 2002 dollars and is based on several assumptions. Preliminary and Final Development Phase costs are assumed to be twelve-percent of the construction cost. Contract Administration and Inspection are assumed to be ten-percent of the construction cost. Contingencies are assumed to be thirty-percent of the construction cost. The sum of those values gives the begin range of the total costs. The end range include an additional five-percent to twenty-percent, depending on the stability of the component.

## Table 2.4 UCAB Project Capital Cost Estimate (2002 Dollars)

| Fiscal Year | | Construction | PDP/FDP | Contract Administration & Inspection | Right of Way Acquisition | Contingencies | Total Project Costs Begin Range | Total Project Costs End Range |
|---|---|---|---|---|---|---|---|---|
| 2015 | UCAB | $93,530,000 | $11,223,600 | $9,353,000 | $20,000,000 | $28,059,000 | **$162,165,600** | **$194,598,720** |
| | **TOTAL** | **$93,530,000** | **$11,223,600** | **$9,353,000** | **$20,000,000** | **$28,059,000** | **$162,165,600** | **$194,598,720** |

# CHAPTER THREE
# Strategic Plan

# CHAPTER THREE

# STRATEGIC PLAN

## 3.1 Innerbelt Strategy: Phasing and Funding

### 3.1.1 Project Development Process

ODOT has defined a 14-step Project Development Process ("PDP") for transportation projects. Steps 1 through 4 comprise the planning process. Steps 5 through 8 are generally referred to as environmental/preliminary engineering. Steps 9 through 12 include right of way acquisition and final design. Steps 13 and 14 are project construction. A more detailed listing of activities in Steps 5 through 12 follows:

**Step 5**
***Develop Conceptual Alternatives***

- Address Public Involvement issues
- Select corridors for further study
- Develop Preliminary Engineering/Environmental Scope of Services
- Perform environmental field studies
- Submit Conceptual Alternatives Study
- Update cost estimates.

**Step 6**
***Develop Feasible Alternatives***

- Develop feasible alternatives and preliminary construction limits
- Perform field refinement environmental studies
- Prepare Assessment of Feasible Alternatives
- Conduct first Value Engineering Study
- Conduct first Constructability Review
- Update cost estimates.

**Step 7**
***Develop Preferred Alternative***

- Recommend preferred alternative
- Refine design plans for preferred alternatives
- Submit Preferred Alternative Verification
- Perform environmental field study/refine impacts
- Prepare Waterway Permit Determination
- Prepare and Submit Categorical Exclusion, Environmental Assessment or Draft Environmental Impact Statement
- Develop Detailed Design Scope of Services
- Update cost estimates and milestone dates.

**Step 8**
***Prepare Environmental Clearance/Develop Stage 1 Design***

- Finalize environmental document (CE, EA or EIS)
- Request Finding of No Significant Impact/Record of Decision/Categorical Exclusion approval
- Develop and Submit Stage 1 Detailed Design
- Establish proposed R/W limits
- Conduct Second Value Engineering Study
- Prepare Final Waterway Permit applications and Conceptual Mitigation Plans
- Update cost estimates.

**Step 9**
***Develop Stage 2 Design***

- Summarize environmental commitments and prepare necessary environmental plan notes
- Prepare Final Mitigation Plans
- Develop and Submit Preliminary R/W plans
- Develop and Submit Stage 2 Detailed Design
- Conduct second Constructability Review
- Update cost estimates.

**Step 10**
***Complete Right of Way Plan and Begin Acquisition***

- Complete and submit Final R/W Plans
- Complete and submit R/W Tracings
- Begin R/W acquisition
- Begin Environmental Mitigation
- Begin utility relocation
- Update utility reimbursement and right of way acquisition costs.

**Step 11**
***Develop Stage 3 Design***

- Develop and Submit Stage 3 Detailed Design
- Prepare Environmental Consultation Form
- Update construction cost estimate.

**Step 12**
***Prepare Final Plan Package***

- Prepare and submit Final Tracings
- Prepare and submit Final Plan Package
- Update construction cost estimate.

ODOT has elected to proceed immediately with Steps 5-8 of the PDP for the Innerbelt Corridor components (PID 77510). It has also been determined to expedite the project deliver schedule to complete design and construction of the East 55$^{th}$ Street grade separation

and the Quigley Road Connector in FY 2007. This will facilitate the construction of the Innerbelt Curve in FY 2008.

Consultant selection for Steps 5-8 for the Innerbelt corridor and Steps 5-12 for East 55th Street, Quigley Road, and the Innerbelt Curve has been completed with authorization scheduled for September 2004.

Implementation of the Freeway Management System has been scheduled for FY 2006. Consultant selection was accomplished through the ODOT April programmatic selection process. Design authorization is anticipated in September 2004.

Steps 5 and 6 for the University Circle Access Boulevard and the CRV Intermodal Connector project will commence in September 2004. Consultant selection is complete.

## 3.2 Early Deployment Components

Three components of the Innerbelt Design Concept have been identified as early deployment items to help facilitate maintenance of traffic and access during construction of subsequent Innerbelt freeway projects in the construction sequence. These components and schedule for construction are:

- Cleveland Freeway Management System Fiscal Year 2006
- East 55th Street Grade Separation Fiscal Year 2007
- Quigley Road Connector Fiscal Year 2007

On May 7, 2004 TRAC announced availability of Tier 1 funding as follows:

***Fiscal Year 2005***

| | |
|---|---|
| East 55th Street Grade Separation Steps 5-12 (PID 77613) | $ 1,100,000 |
| Quigley Road Connector Steps 5-12 (PID 76941) | $ 4,000,000 |
| Freeway Management System Steps 5-12 (PID 77331) | $ 1,600,000 |

***Fiscal Year 2006***

| | |
|---|---|
| Freeway Management System Steps 13-14 | $ 21,200,000 |

***Fiscal Year 2007***

| | |
|---|---|
| East 55th Street Grade Separation Steps 13-14 | $ 6,000,000 |
| Quigley Road Connector Steps 13-14 | $ 10,000,000 |

## 3.3 Innerbelt Corridor Components: I-71/I-90/I-77

The interstate freeway improvements on I-71, I-90, and I-77 have been divided into five distinct components and sequenced for construction as follows:

- Innerbelt Curve — Fiscal Year 2008
- Central Viaduct — Fiscal Year 2011
- South Innerbelt — Fiscal Year 2011
- Central Interchange I-90/I-77 — Fiscal Year 2013
- Downtown Innerbelt Trench — Fiscal Year 2013

Presently ODOT has committed to funding the interstate freeway components of the project through TRAC funding. No local funds are being sought for these components of the Innerbelt reconstruction.

On May 7, 2004 TRAC announced availability of Tier 1 funding through FY 2009 as follows:

***Fiscal Year 2005***

**Chapter 3** Innerbelt Corridor Steps 5-8 (PID 77510) $ 16,000,000

***Fiscal Year 2006***

| | |
|---|---|
| Innerbelt Corridor Steps 5-8 (PID 77510) | $ 8,000,000 |
| Innerbelt Curve Steps 9-12 (PID 77413) | $ 14,000,000 |

***Fiscal Year 2007***

| | |
|---|---|
| Innerbelt Curve Steps 9-12 (PID) 77413) | $ 5,900,000 |
| Central Viaduct & S. Innerbelt Steps 9-12 (PID 77332) | $ 18,000,000 |

***Fiscal Year 2008***

| | |
|---|---|
| Innerbelt Curve Steps 13-14 | $ 94,000,000 |
| Central Viaduct & S. Innerbelt Steps 9-12 (PID 77332) | $ 15,000,000 |
| Central Interchange/Trench Design Steps 9-12 (PID 25795) | $ 9,000,000 |

***Fiscal Year 2009***

| | |
|---|---|
| Central Interchange/Trench Steps 9-12 (PID 25795) | $ 12,000,000 |

The remainder of the project will be constructed in 2011-2015. It is ODOT's intention to seek additional TRAC funding in subsequent years.

Complete project budget details are shown in Table 3.1.

**Table 3.1 TRAC Funding Commitments May 7, 2004**

| Project | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|
| | | | | | |
| Innerbelt Corridor 5-8 (PID 77510) | $16.0 | $8.0 | | | |
| | | | | | |
| Innerbelt Curve (PID 77413)<br>9-12<br>13-14 | | $14.0 | $5.9 | $94.0 | |
| | | | | | |
| East 55th Street Grade Separation (PID 77613)<br>9-12<br>13-14 | $1.1 | | $6.0 | | |
| | | | | | |
| Quigley Road Connector (PID 76941)<br>9-12<br>13-14 | $4.0 | | $10.0 | | |
| | | | | | |
| Central Viaduct and Southern Innerbelt (PID 77332)<br>9-12 | | | $18.0 | $15.0 | |
| | | | | | |
| Central Interchange/Trench (PID 25795)<br>9-12 | | | | $9.0 | $12.0 |
| | | | | | |
| Cleveland Freeway Management System (PID 77331)<br>9-12<br>13-14 | $1.6 | $21.2 | | | |
| | | | | | |
| University Circle Access Blvd. (PID 77333)<br>5-6 | $5.3 | | | | |
| | | | | | |
| CRV Intermodal Connector (PID 77334) | $2.6 | | | | |

The initial design and construction projects of the Design Concept and Scope have been identified in the NOACA Transportation Improvement Program (TIP) for $243,700,000 with the funding source identified through the TRAC. The funding for the remaining $702,600,000 for the Innerbelt projects (Section 2.2.1) has been identified in the long range Job and Progress Program of the State of Ohio as a combination of State and Federal funding. The long term funding assumes federal funding will remain at current levels plus some favorable adjustments (e.g., ethanol and donor state adjustments). Funding for the Cuyahoga River Valley Intermodal Connector Project - $94,500,000 - (Section 2.2.2) and the University Circle Access Boulevard Project – $194,600,000 - (Section 2.2.3) will be a

combination of local, state and Federal funding. The funding will depend upon route designations, phasing and final design considerations.

## 3.4 Corridors Recommended For Further Study

### 3.4.1 University Circle Access Boulevard (UCAB) Sub-Area Corridor Study (PID 77333)

The UCAB project is proposed on new alignment through the eastside neighborhoods approximately following the existing railroad corridor. Four potential conceptual alignments were examined in the CIS. Cost estimates are preliminary at this point and are based on planning level data.

The facility would be located entirely within the City of Cleveland. No agreement has been reached between Cleveland, NOACA, and ODOT on the sponsoring agency for construction. Based on the conclusions of the CIS, ODOT will continue the project through an environmental analysis and a detailed alignment study to better define the project, assess feasible alignments, and develop a more refined capital cost estimate.

To this end, ODOT requested, and was granted an allocation of TRAC funding to pursue the project through Steps 5 and 6 of the PDP. TRAC allocated $5,300,000 in FY 2005 for Tier 2 (PID 77333). Upon completion of Step 6, ODOT, NOACA, and Cleveland will determine how to proceed on project implementation.

Potential funding sources to be examined include:

- Additional TRAC funds
- Locally attributable STP funds from NOACA, and local sources
- Tax Increment Financing (TIF) District
- A local transportation assessment district
- Establishment of a Transportation Improvement District (TID) in Cuyahoga County
- City funds.

### 3.4.2 Cuyahoga River Valley Intermodal Connector (CRVIC) (PID 77334)

This component of the Innerbelt strategy is fairly well defined as it primarily follows existing Quigley Road, West 3rd Street and a portion of an abandoned rail alignment forming a transportation backbone. There are a number of alternatives for connections to this transportation backbone that need to be developed and assessed through further study. These additional components include: a low-level, lift-bridge connection between the west and east banks of the Cuyahoga River; an at-grade connection between the north end of West 3rd Street and the east bank of the Valley; a new connection between the north end of West 3rd Street and the Central Interchange area; a reconfiguration of the partial interchange at I-490/West 7th Street to provide a full interchange; and, an extension of Quigley Road south to Jennings Road through the west bank International Steel Group (ISG) property to connect with the Quigley Road Extension.

Detailed alignment and environmental work will be necessary to determine final feasibility of the proposed facility and develop a more refined capital cost estimate. These studies will commence in September 2004. In May 2004, TRAC allocated $ 2,600,000 of Tier 2 funding to PDP Steps 5-6. ODOT intends to initiate this work in September 2004. At the completion of this study, ODOT and local agencies will determine how to proceed with the project.

No agreement has been reached between ODOT, NOACA, and the City on the determination of a sponsoring agency for construction. However, all participants have agreed that the project's planning should continue through PDP Step 6 to determine the alignment, environmental constraints, and a more refined capital cost. ODOT will sponsor these studies.

Potential funding sources to be evaluated include:

- Additional TRAC funding
- Tax Increment Financing
- NOACA STP funding
- Transportation Assessment District
- Port Authority financing
- TID funding
- City funds

### 3.4.3 Traffic Management Program

The traffic management program is comprised of four project components designed to assist in better traffic flow through use of Transportation Systems Management (TSM) actions. These include:

- Cleveland Freeway Management System (FMS) (See Early Deployment)
- Arterial Management System (AMS)
- Priority Corridor System
- GCRTA Park & Ride Expansions and Service Increases

### 3.4.4 Freeway Management System (PID 77331)

The Freeway Management System is a regional project being implemented on the entire Cleveland area interstate system. The FMS includes the implementation of a series of ITS improvements on I-71/I-90/I-77/I-480/I-490 in the Innerbelt corridor. The project components are defined in PID 77331 and are generally as follows:

1. Incident Detection
2. Verification/Traffic Monitoring and Surveillance
3. Notification System
4. Traveler Information (Dynamic Message Signs and Highway Advisory Radio).

The FMS is based on preliminary work completed by ODOT in January 2004. Tier 1 TRAC funding has been allocated as follows:

- FY 2005 Steps 5-12 $ 1,600,000
- FY 2006 Steps 13-14 $ 21,200,000

The implementation of the FMS has been planned to coincide with the initial construction phases of the Innerbelt freeway sequence to assist in maintenance of traffic efforts.

### 3.4.5 Arterial Management System (Downtown Cleveland)

The AMS proposes implementation of a computerized signalization system for managing flow on the Cleveland CBD street system providing access and egress to the freeway. This system would be a locally (Cleveland) monitored system allowing for real-time signal adjustments to manage flow. This system would complete Cleveland's CBD signal system improvements that have been ongoing for several years.

To date, no funding has been committed for this component of the strategy. The appropriate sponsoring agency would be the City of Cleveland. The use of NOACA CMAQ funding has been discussed with no current commitment. The estimated capital cost is approximately $5,000,000.

### 3.4.6 Priority Corridor System

The Priority Corridor System proposes a series of improvements to the downtown Cleveland arterial street system to develop a hierarchical street classification system, improve traffic flow and enhance pedestrian safety/circulation. Some of these improvements may be undertaken as maintenance of traffic measures to portions of the freeway modifications. While the priority corridor system has been conceptually identified, recommended improvements have been defined and will be developed and assessed in the next steps of the process.

Again, the City of Cleveland would be the designated sponsoring agency, but no funding strategy has been identified.

### 3.4.7 Transit Improvements

Greater Cleveland Regional Transit Authority (GCRTA) has been identified as the sponsoring agency for the Park & Ride and bus service improvements. These may be pursued as maintenance of traffic efforts or as separate improvements. This will be determined as part of the scope of work in steps 5-8 for the freeway components.

If pursued separately, regional Congestion Mitigation/Air Quality (CMAQ) funds are being considered as a potential funding source along with Federal Transit Administration Sec. 5307 or 5309 funds. CMAQ funding is available from FHWA for transportation projects that will improve air quality by reducing the number of auto trips or relieving congestion.

## 3.5 Actions and Next Steps

### 3.5.1 Concurrence Actions

On February 12, 2004, the Innerbelt Scoping Committee reached official concurrence on the Design Concept and Scope. The next step was for NOACA, the regional Metropolitan Planning Organization (MPO), to adopt the recommendations of the MIS into the region's Long Range Transportation Plan and program the initial elements of the strategy into the

# FIGURE 3-1: Cleveland Innerbelt Plan Project Implementation Sequence

Transportation Improvement Program. Officially, NOACA was asked to adopt the following components:

- Innerbelt Corridor Steps 5-8 — Tier 1 Plan/TIP
- East 55th Street Grade Separation Steps 5-14 — Tier 1 Plan/TIP
- Quigley Road Connector Steps 5-14 — Tier 1 Plan/TIP
- Innerbelt Curve Steps 5-14 — Tier 1 Plan/TIP
- Freeway Management System Steps 5-14 — Tier 1 Plan/TIP
- University Circle Access Blvd. Steps 5-6 — Tier 3 Plan/TIP
- CRV Intermodal Connector Steps 5-6 — Tier 3 Plan/TIP
- Central Viaduct, S. Innerbelt, Central Interchange, Trench Steps 9-14 — Tier 3 Plan.

NOACA Board passed Resolution No. 2004-037 on July 9, 2004. ODOT is currently requesting FHWA concurrence.

As a part of the ongoing MPO planning process at NOACA two systems planning issues remain to be resolved:

1. Inclusion of the University Circle Access Boulevard on the region's Functional Classification System
2. Designation of the CRV Intermodal Connector and inclusion on the Functional Classification System

These actions are necessary to include these facilities in the regional transportation network making them eligible for inclusion in the regional plan.

All components of the recommended design concept, except the University Circle Boulevard and the Intermodal Connector, have been analyzed by the NOACA staff for air quality conformity. The analysis was completed (Section 1.5.9) prior to NOACA Board action to amend the Plan.

### 3.5.2 ODOT/City of Cleveland Interagency Coordination Agreement

To ensure timely project implementation and to resolve any design or environmental issues which might impact project schedule or cost, ODOT and the City of Cleveland concurred to develop an Interagency Coordination Agreement for the Innerbelt Plan. This agreement will help coordinate the actions of the individual agencies. ODOT and the City of Cleveland have been negotiating the agreement since late April 2004.

### 3.5.3 Continuing Public Involvement Process

A public involvement open house was held on June 16, 2004 at the Visiting Nurse's Association in downtown Cleveland. At that open house, ODOT presented the Cleveland Innerbelt Plan, which combines the Design Concept and Scope with an Implementation Strategy. At this meeting information was also presented about the continuing public involvement opportunities to be undertaken in the next phases of the project(s).

Throughout the preliminary development and design phases of the project, ODOT will continue to support a public involvement approach focused on integrating community input into the process. The planning phase of the project dealt with a myriad of issues and alternatives of keen interest to the public.

Now that the process has yielded a design concept, the remaining community issues have become more clearly defined. While no less complex or important, this clarity allows the public involvement effort to become more focused and refined in this next phase of project development. This focus and refinement will also be necessitated by the ambitious schedule set by ODOT for project delivery. The public involvement, public relations, and public education process will need to be adapted to be efficient and effective to meet these requirements. It is intended that combined and coordinated public input requirements will be facilitated through the Interagency Coordination Agreement with Cleveland assuring that both agencies' needs are met.

The public involvement process will focus on:

- Providing timely and accurate information to the public
- Addressing community concerns
- Incorporating community input
- Ensuring a continued good working relationship with the City of Cleveland
- Providing timely and accurate information to local media
- Meeting the public involvement requirements unique to NEPA
- Accurate and complete documentation of the process.

Project Advisory Committee

A Project Advisory Committee will be formed. The formation and activity of the committee will address concerns previously expressed from the public, elected officials, and local government agencies that ODOT needs to keep the community at-large involved through a structured medium. It is anticipated that this committee will be comprised of representatives culled from the ranks of the previous Cleveland Innerbelt Scoping Committee. These representatives should be people directly representing stakeholder's interests as related to the I-71/I-90 improvements proposed. This committee will meet approximately two to three times annually through the course of the project. Its role would be as follows:

- Advisory to ODOT and the City of Cleveland
- Serve as a community "sounding board"
- Serve as a source of input and a forum for information and discussion
- Serve as a vehicle for regular progress reports to the community.

City of Cleveland-Community Planning

The City of Cleveland has been, and will continue to be, a dominant player in the project development process. The City administration has indicated that the City's lead will be taken by the City Planning Commission. City Council has also indicated a desire to actively participate. Ultimately, the City's continuing role in the process will be spelled out in the Interagency Cooperation Agreement under development between the City and ODOT.

Issues Workshops

ODOT has found that an effective forum for conflict resolution and citizen input in the planning process has been the use of issue(s) workshops. Bringing together a team of stakeholders and planning/design professionals to focus on specific issues for localized areas has been extremely effective in the aspects of time and problem definition/resolution.

ODOT proposes the continued use of specific issue-related workshops with the community throughout the NEPA process to resolve environmental issues with specific stakeholder groups in specified neighborhood areas as required.

Public Meetings

ODOT's 14-Step Project Development Process dictates public involvement meetings to be held at specified points in the process to meet NEPA requirements. Ample opportunity will be provided for input and Q&A through comment cards, public comment stations, website/email, etc.

Meetings will be well advertised in advance in a variety of print and electronic media and well documented. A series of two public meetings when required will allow for more personal contact with the public and ensure better participation through locational options. Based on the input received at the first meeting, project refinements often take place prior to the next meeting.

Newsletter

The *Innerbelt Access* newsletter will continue as a vehicle to continue to keep the public informed of progress on the project development.

Website

ODOT District 12 Public Information staff will continue in the updating of the project website.

Media Relations

ODOT PI staff will continue in the area of media relations with both print and electronic media. Specific items to address are:

- A kickoff briefing with the press upon project authorization to explain the next phases of work and the project schedule
- An editorial board briefing with the *Cleveland Plain Dealer* at project initiation (and periodic briefings through project development)
- Reporter briefings before, or after, each Project Advisory Committee meeting.

Local Agency Coordination

As in the planning phase, coordination meetings will be held as necessary with local government agencies:

- Cleveland City Planning Commission
- Cleveland City Council
- GCRTA
- NOACA
- NEORSD
- Cuyahoga County.

NEPA Requirements

Specific PI efforts will be undertaken in support of NEPA and design activities as identified in ODOT's Public Involvement Guide of 11/26/02 for PDP Steps 5 through 14 for all projects.

### 3.5.4 Project Delivery Strategy and Budget

Table 3.2 shows the current budget for the multiple components of the strategy. Table 3.3 shows the Innerbelt Strategic Plan Schedule.

## Table 3.2
## Cleveland Innerbelt Plan
***Summary of Projected Costs and Budget***

## Cleveland Innerbelt
## *Forecasted Program Expenditures*

| *Innerbelt Corridor* | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 [2] | 2011 [2] | 2012 [2] | 2013 [2] | 2014 [2] | 2015 [2] | 2016 [2] | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Planning (PDP 5-8) | $16,000,000 | $8,000,000 | | | | | | | | | | | $24,000,000 |
| Design | $1,600,000 | $8,000,000 | $18,400,000 | $24,000,000 | $9,000,000 | $12,600,000 | | | | | | | $73,600,000 |
| R/W [1] | $3,500,000 | $6,000,000 | $5,500,000 | | $3,000,000 | | | | | | | | $18,000,000 |
| Construction | | | $16,000,000 | $94,000,000 | | | $407,800,000 | | $287,900,000 | | | | $805,700,000 |
| Annual Program Total | $21,100,000 | $22,000,000 | $39,900,000 | $118,000,000 | $12,000,000 | $12,600,000 | $407,800,000 | | $287,900,000 | | | | $921,300,000 |
| *Cumulative Program Total* | $21,100,000 | $43,100,000 | $83,000,000 | $201,000,000 | $213,000,000 | $225,600,000 | $633,400,000 | $633,400,000 | $921,300,000 | $921,300,000 | $921,300,000 | $921,300,000 | $921,300,000 |
| *TRAC Funds* | $21,100,000 | $22,000,000 | $39,900,000 | $118,000,000 | $12,000,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $213,000,000 |
| *Cumulative TRAC Funds* | $21,100,000 | $43,100,000 | $83,000,000 | $201,000,000 | $213,000,000 | $213,000,000 | $213,000,000 | $213,000,000 | $213,000,000 | $213,000,000 | $213,000,000 | $213,000,000 | $213,000,000 |
| | | | | | | | | | | | | | |

| *University Circle Access Blvd.* | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 [2] | 2011 [2] | 2012 [2] | 2013 [2] | 2014 [2] | 2015 [2] | 2016 [2] | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Planning (PDP 5-8) | $5,300,000 | | | | | | | | | | | | $5,300,000 |
| Design | | | | | | | | | | | | | $0 |
| R/W [1] | | | | | | | | | | | | | $0 |
| Construction | | | | | | | | | | | | | $0 |
| Annual Program Total | $5,300,000 | | | | | | | | | | | | $5,300,000 |
| *Cumulative Program Total* | $5,300,000 | | | | | | | | | | | | $0 |
| *TRAC Funds* | $5,300,000 | | | | | | | | | | | | $5,300,000 |
| *Cumulative TRAC Funds* | $5,300,000 | $5,300,000 | $5,300,000 | $5,300,000 | $5,300,000 | $5,300,000 | $5,300,000 | $5,300,000 | $5,300,000 | $5,300,000 | $5,300,000 | $5,300,000 | $5,300,000 |
| *Non-TRAC Federal* | | | | | | | | | | | | | |
| *Local* | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| *CRV Intermodal Connector* | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 [2] | 2011 [2] | 2012 [2] | 2013 [2] | 2014 [2] | 2015 [2] | 2016 [2] | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Planning (PDP 5-8) | $2,600,000 | | | | | | | | | | | | $2,600,000 |
| Design | | | | | | | | | | | | | $0 |
| R/W [1] | | | | | | | | | | | | | $0 |
| Construction | | | | | | | | | | | | | $0 |
| Annual Program Total | $2,600,000 | | | | | | | | | | | | $2,600,000 |
| *Cumulative Program Total* | $2,600,000 | | | | | | | | | | | | $0 |
| *TRAC Funds* | $2,600,000 | | | | | | | | | | | | $2,600,000 |
| *Cumulative TRAC Funds* | $2,600,000 | $2,600,000 | $2,600,000 | $2,600,000 | $2,600,000 | $2,600,000 | $2,600,000 | $2,600,000 | $2,600,000 | $2,600,000 | $2,600,000 | $2,600,000 | $2,600,000 |
| *Non TRAC Federal* | | | | | | | | | | | | | |
| *Local* | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

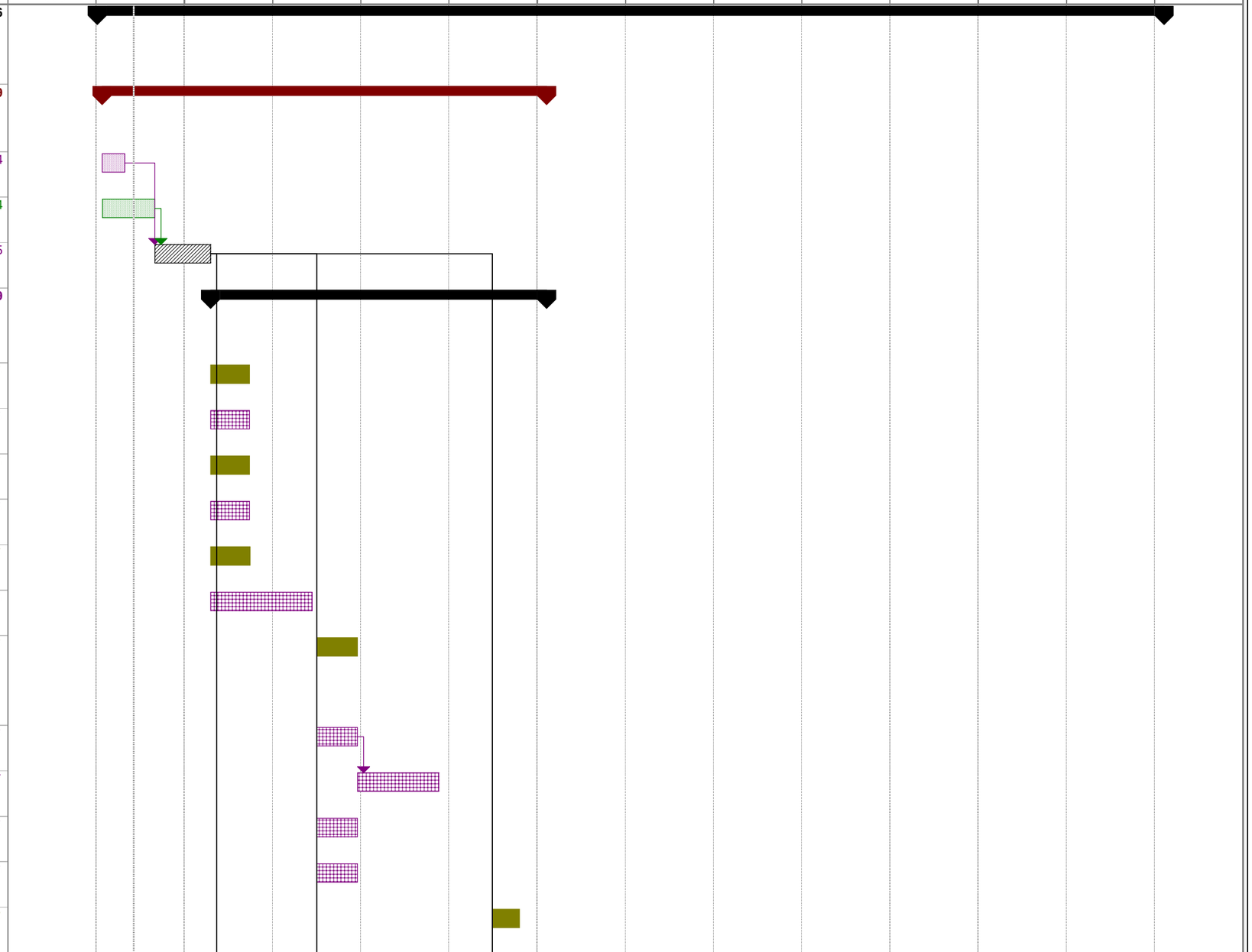
| *Traffic Management Program* | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 [2] | 2011 [2] | 2012 [2] | 2013 [2] | 2014 [2] | 2015 [2] | 2016 [2] | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Planning (PDP 5-8) | | | | | | | | | | | | | $0 |
| Design | $1,600,000 | | | | | | | | | | | | $1,600,000 |
| R/W [1] | | | | | | | | | | | | | $0 |
| Construction | | $21,200,000 | | | | | | | | | | | $21,200,000 |
| Annual Program Total | $1,600,000 | $21,200,000 | | | | | | | | | | | $22,800,000 |
| *Cumulative Program Total* | $1,600,000 | $22,800,000 | | | | | | | | | | | $0 |
| *TRAC Funds* | $1,600,000 | $21,200,000 | | | | | | | | | | | $22,800,000 |
| *Cumulative TRAC Funds* | $1,600,000 | $22,800,000 | $22,800,000 | $22,800,000 | $22,800,000 | $22,800,000 | $22,800,000 | $22,800,000 | $22,800,000 | $22,800,000 | $22,800,000 | $22,800,000 | $22,800,000 |
| *Non TRAC Federal* | | | | | | | | | | | | | |
| *Local* | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

[1] R/W estimates are based on land and structure, compensable utility damage, and railroad relocation costs.

[2] Cost estimates from 2010 to 2015 include inflationary adjustments based on factors provided by ODOT Consultant Services

# *Innerbelt Strategic Plan Schedule*

| ID | PID | Type | Task Name | Start | Finish |
|---|---|---|---|---|---|
| 1 | | | **Cleveland Innerbelt Program** | **Thu 1/8/04** | **Wed 2/10/16** |
| 2 | | | **Cleveland Innerbelt Corridor** | **Wed 1/28/04** | **Mon 2/9/09** |
| 3 | | 1P | Finish Steps 1 - 4 from Study | Wed 1/28/04 | Fri 4/30/04 |
| 4 | 77510 | 8O | Consultant Procurement | Thu 1/29/04 | Wed 9/1/04 |
| 5 | 77510 | 1P | PDP Steps 5 & 6 for Entire Corridor | Thu 9/2/04 | Wed 4/20/05 |
| 6 | 77510 | | **PDP Steps 7 & 8 (NEPA and Stage 1 Design) for projects within Corridor. These tasks are included under PID 77510.** | **Thu 4/21/05** | **Mon 2/9/09** |
| 7 | *77613* | *1E* | ***East 55th Street NEPA*** | *Thu 4/21/05* | *Wed 9/28/05* |
| 8 | 77613 | *1P* | *East 55th Street Stage 1 Design* | *Thu 4/21/05* | *Wed 9/28/05* |
| 9 | *76941* | *1E* | ***Quigley Road NEPA*** | *Thu 4/21/05* | *Wed 9/28/05* |
| 10 | 76941 | *1P* | *Quigley Road Stage 1 Design* | *Thu 4/21/05* | *Wed 9/28/05* |
| 11 | *77510* | *1E* | ***Innerbelt Curve NEPA*** | *Thu 4/21/05* | *Fri 9/30/05* |
| 12 | 77510 | *1P* | *Innerbelt Curve Stage 1 Design* | *Thu 4/21/05* | *Wed 6/14/06* |
| 13 | *77510* | *1E* | ***NEPA for Innerbelt South (Includes Hospital Curve Widening, Central Viaduct and Fulton Road)*** | *Wed 7/5/06* | *Tue 12/19/06* |
| 14 | 77510 | *1P* | *Central Viaduct Bridge Substructure Stage 1 Design* | *Wed 7/5/06* | *Tue 12/19/06* |
| 15 | 77510 | *1P* | *Central Viaduct Bridge Superstructure Stage 1 Design* | *Wed 12/20/06* | *Tue 11/20/07* |
| 16 | 77510 | *1P* | *Innerbelt South- Hospital Curve Widening Stage 1 Design* | *Wed 7/5/06* | *Tue 12/19/06* |
| 17 | 77510 | *1P* | *Innerbelt South- Fulton Road Stage 1 Design* | *Wed 7/5/06* | *Tue 12/19/06* |
| 18 | *77510* | *1E* | ***NEPA for Trench, Central Interchange, and I-77 Widening*** | *Tue 7/1/08* | *Mon 10/20/08* |



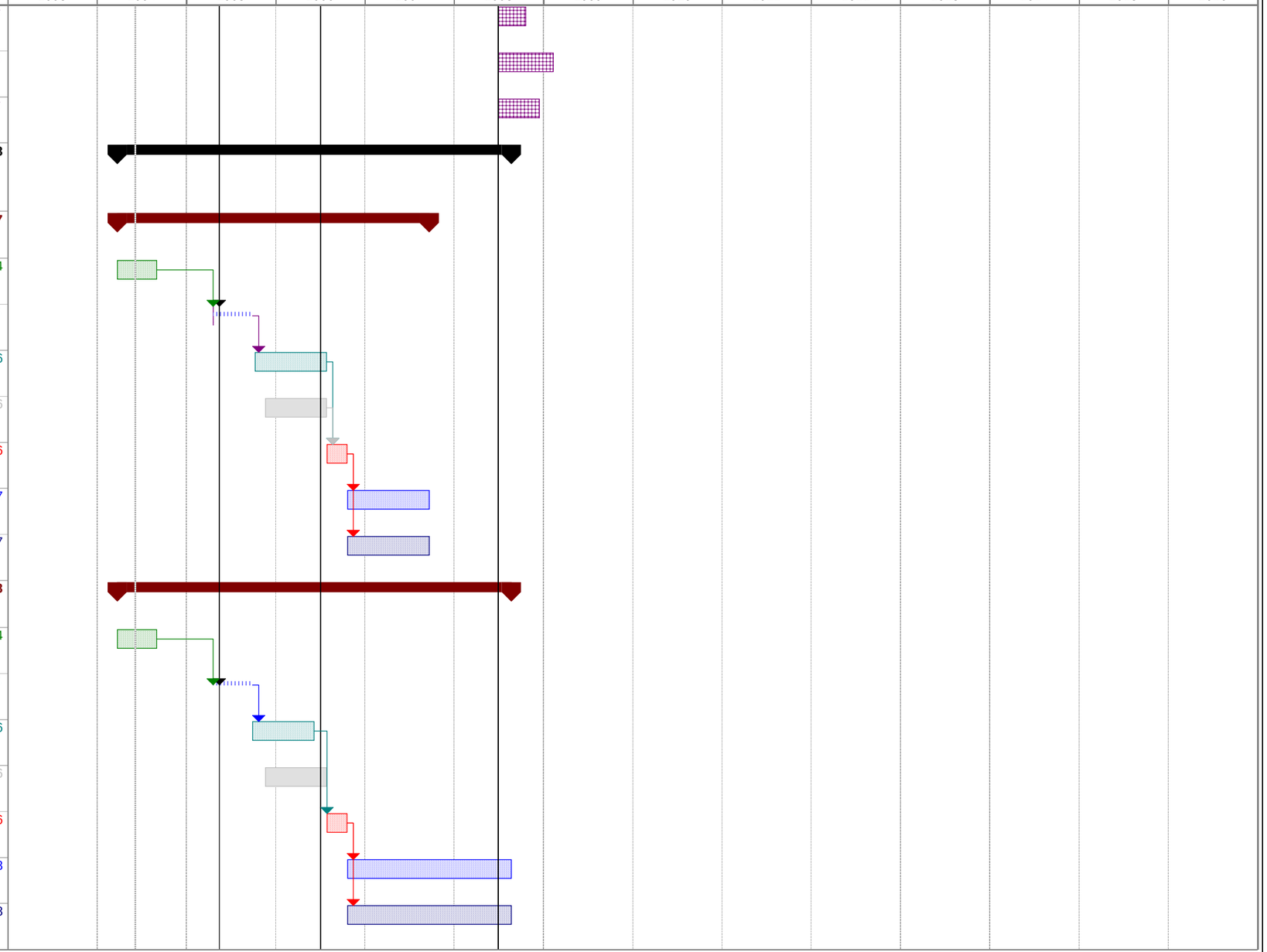

**Project: Cleveland Innerbelt (Basic)**
**Date: Thu 6/3/04**

BURGESS & NIPLE

| | | | | | |
|---|---|---|---|---|---|
| Task | | Summary | | Rolled Up Progress | Project Summary |
| Progress | | Rolled Up Task | | Split | Group By Summary |
| Milestone | | Rolled Up Milestone | | External Tasks | |

# *Innerbelt Strategic Plan Schedule*

| ID | PID | Type | Task Name | Start | Finish |
|---|---|---|---|---|---|
| 19 | 77510 | *1P* | *I-77 Widening Stage 1 Design* | *Tue 7/1/08* | *Mon 10/20/08* |
| 20 | 77510 | *1P* | *Central Interchange Stage 1 Design* | *Tue 7/1/08* | *Mon 2/9/09* |
| 21 | 77510 | *1P* | *Innerbelt Trench Stage 1 Design* | *Tue 7/1/08* | *Mon 12/15/08* |
| 22 | | | **Supporting Projects** | **Thu 3/25/04** | **Fri 8/22/08** |
| 23 | 77613 | | **East 55th Street R.R. Bridge Reconstruction** | **Thu 3/25/04** | **Fri 9/21/07** |
| 24 | 77613 | 8O | Consultant Procurement | Thu 3/25/04 | Wed 9/1/04 |
| 25 | *77613* | *1P* | *PDP Steps 7 & 8 (NEPA and Stage 1 Design) See PID* | *Thu 4/21/05* | *Wed 9/28/05* |
| 26 | 77613 | 4D | Design (PDP 9-12) | Mon 10/10/05 | Fri 7/28/06 |
| 27 | 77613 | 5R | R/W (Utilities) | Mon 11/21/05 | Fri 7/28/06 |
| 28 | 77613 | 6C | Bid | Mon 7/31/06 | Fri 10/20/06 |
| 29 | | 6C | Construction | Mon 10/23/06 | Fri 9/21/07 |
| 30 | | 7CA | Construction Admin. | Mon 10/23/06 | Fri 9/21/07 |
| 31 | 76941 | | **Quigley Road Connector** | **Thu 3/25/04** | **Fri 8/22/08** |
| 32 | 76941 | 8O | Consultant Procurement | Thu 3/25/04 | Wed 9/1/04 |
| 33 | *76941* | *1P* | *PDP Steps 7 & 8 (NEPA and Stage 1 Design) See PID 77510* | *Thu 4/21/05* | *Wed 9/28/05* |
| 34 | 76941 | 4D | Design (PDP 9-12) | Thu 9/29/05 | Wed 6/7/06 |
| 35 | 76941 | 5R | R/W (Utilities) | Mon 11/21/05 | Fri 7/28/06 |
| 36 | 76941 | 6C | Bid | Mon 7/31/06 | Fri 10/20/06 |
| 37 | 76941 | 6C | Construction | Mon 10/23/06 | Fri 8/22/08 |
| 38 | 76941 | 7CA | Construction Admin. | Mon 10/23/06 | Fri 8/22/08 |



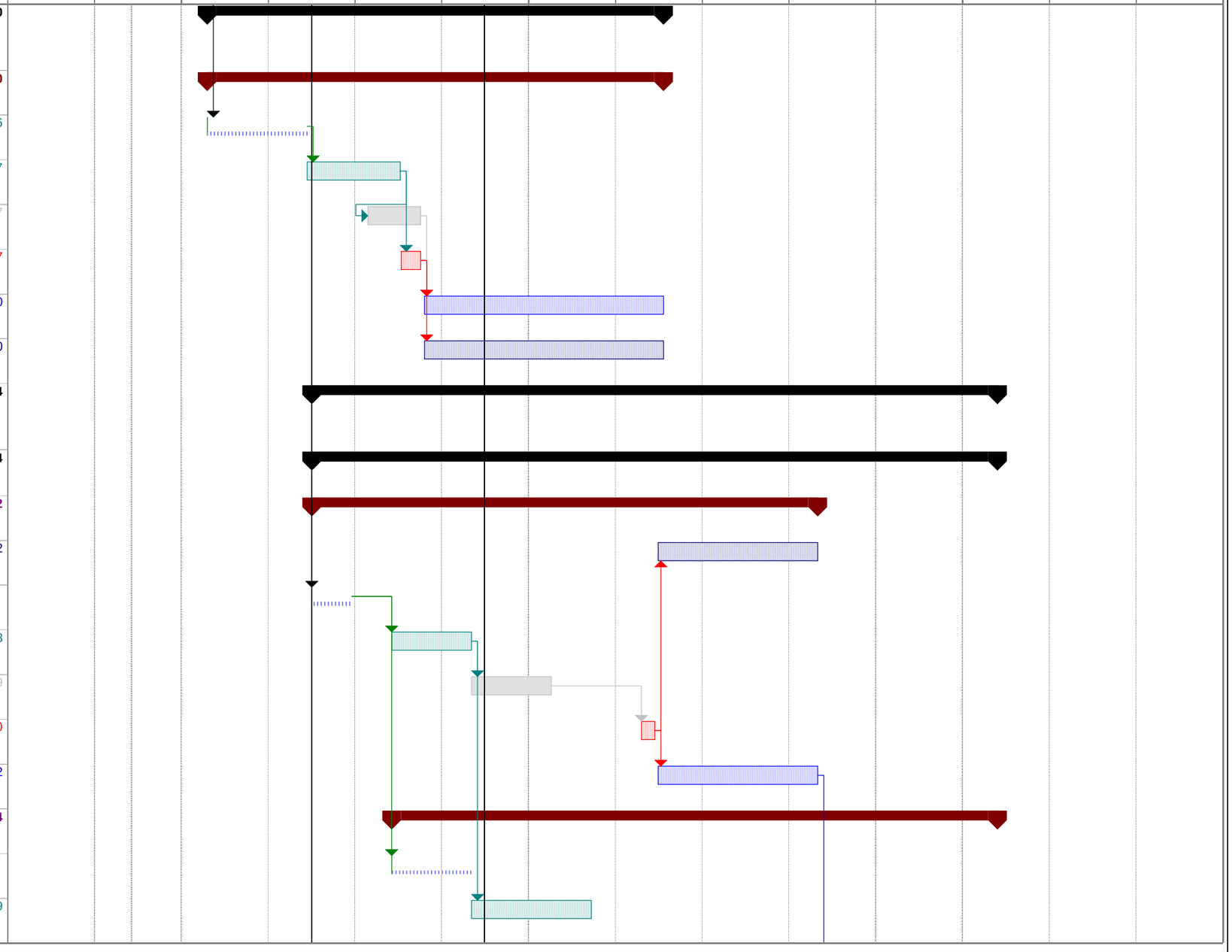

**Project: Cleveland Innerbelt (Basic)**
**Date: Thu 6/3/04**

BURGESS & NIPLE

| | | | | | |
|---|---|---|---|---|---|
| Task | Summary | Rolled Up Progress | Project Summary |
| Progress | Rolled Up Task | Split | Group By Summary |
| Milestone | Rolled Up Milestone | External Tasks | |

# *Innerbelt Strategic Plan Schedule*

| ID | PID | Type | Task Name | Start | Finish |
|---|---|---|---|---|---|
| 39 | 77413 | | **Innerbelt Curve** | **Wed 4/20/05** | **Fri 7/23/10** |
| 40 | 77413 | | **Innerbelt Curve** | **Wed 4/20/05** | **Fri 7/23/10** |
| 41 | 77413 | 8O | PDP Steps 7 & 8 (NEPA and Stage 1 Design) | Wed 4/20/05 | Wed 6/14/06 |
| 42 | 77413 | 4D | Design (PDP 9-12) | Thu 6/15/06 | Wed 7/11/07 |
| 43 | 77413 | 5R | R/W (Utilities) | Mon 2/26/07 | Fri 10/5/07 |
| 44 | 77413 | 6C | Bid | Mon 7/16/07 | Fri 10/5/07 |
| 45 | 77413 | 6C | Construction | Mon 10/22/07 | Fri 7/23/10 |
| 46 | 77413 | 7CA | Construction Admin. | Mon 10/22/07 | Fri 7/23/10 |
| 47 | 77332 | | **Innerbelt South** | **Wed 7/5/06** | **Wed 5/28/14** |
| 48 | 77332 | | **Central Viaduct** | **Wed 7/5/06** | **Wed 5/28/14** |
| 49 | 77332 | | **Central Viaduct Foundations** | **Wed 7/5/06** | **Wed 5/2/12** |
| 50 | 77332 | 7CA | Construction Admin. | Thu 7/1/10 | Wed 5/2/12 |
| 51 | *77332* | *8O* | *PDP Stages 7 & 8 (See PID 77510)* | *Wed 7/5/06* | *Tue 12/19/06* |
| 52 | 77332 | 4D | Design (PDP 9-12) | Wed 6/6/07 | Tue 5/6/08 |
| 53 | 77332 | 5R | R/W(Utilities) | Wed 5/7/08 | Tue 4/7/09 |
| 54 | 77332 | 6C | Bid | Thu 4/22/10 | Wed 6/16/10 |
| 55 | 77332 | 6C | Construction | Thu 7/1/10 | Wed 5/2/12 |
| 56 | 77332 | | **Central Viaduct Bridge** | **Tue 6/5/07** | **Wed 5/28/14** |
| 57 | *77332* | *8O* | *PDP Stage 1 Design (See PID 77510)* | *Tue 6/5/07* | *Tue 5/6/08* |
| 58 | 77332 | 4D | Design (PDP 9-12) | Wed 5/7/08 | Tue 9/22/09 |



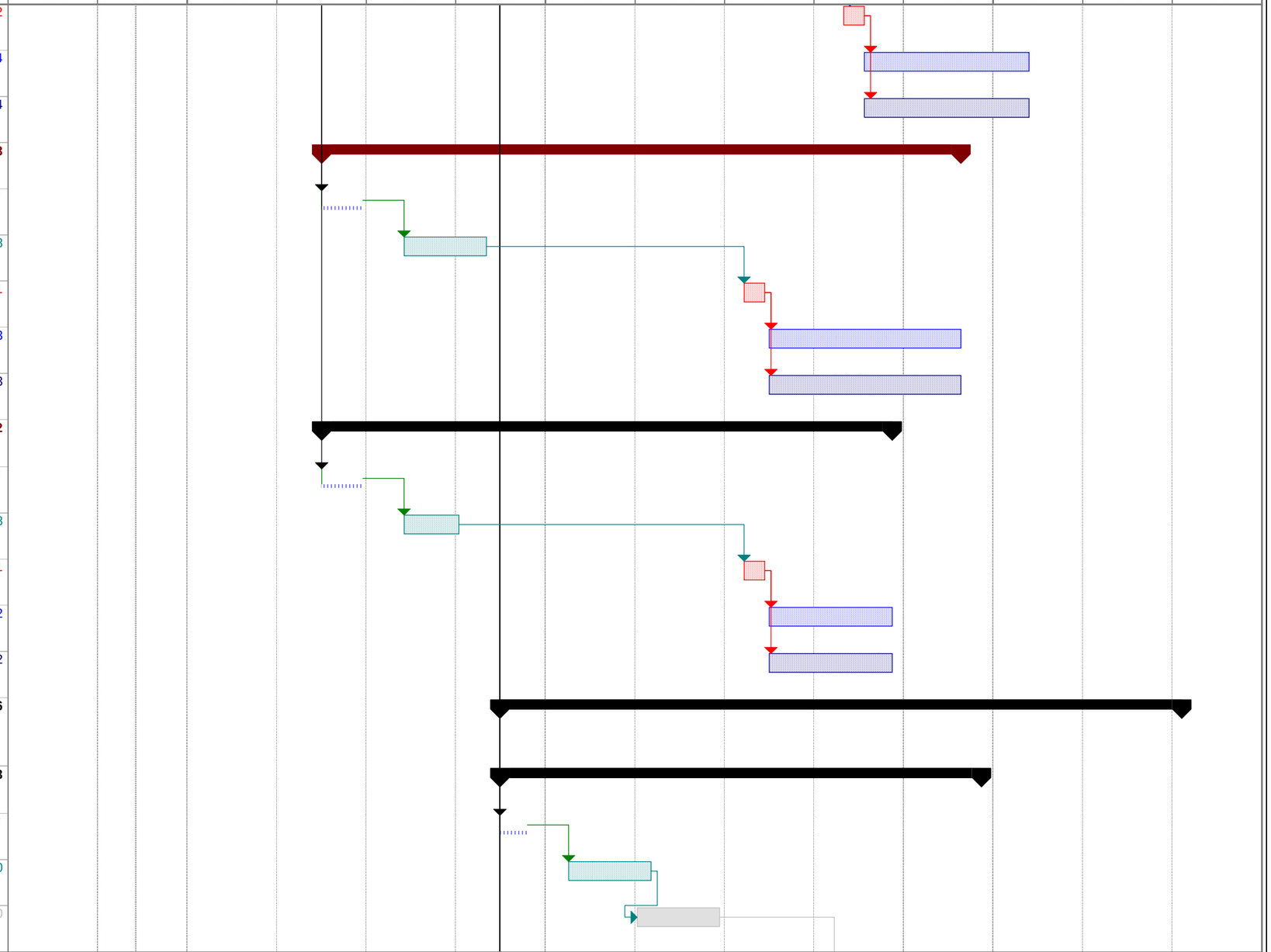

**Project: Cleveland Innerbelt (Basic)**
**Date: Thu 6/3/04**

BURGESS & NIPLE

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary

# *Innerbelt Strategic Plan Schedule*

| ID | PID | Type | Task Name | Start | Finish |
|---|---|---|---|---|---|
| 59 | 77332 | 6C | Bid | Thu 5/3/12 | Wed 7/25/12 |
| 60 | 77332 | 6C | Construction | Thu 7/26/12 | Wed 5/28/14 |
| 61 | 77332 | 7CA | Construction Admin. | Thu 7/26/12 | Wed 5/28/14 |
| 62 | 77332 | | **Innerbelt South - Hospital Curve Widening** | **Wed 7/5/06** | **Fri 8/23/13** |
| 63 | *77332* | *8O* | *PDP Steps 7 & 8 (See PID 77510)* | *Wed 7/5/06* | *Tue 12/19/06* |
| 64 | 77332 | 4D | Design (PDP 9-12) | Wed 6/6/07 | Tue 5/6/08 |
| 65 | 77332 | 6C | Bid | Thu 3/24/11 | Wed 6/15/11 |
| 66 | 77332 | 6C | Construction | Mon 7/4/11 | Fri 8/23/13 |
| 67 | 77332 | 7CA | Construction Admin. | Mon 7/4/11 | Fri 8/23/13 |
| 68 | 77332 | | **Innerbelt South - Fulton/25th/C-D** | **Wed 7/5/06** | **Fri 11/16/12** |
| 69 | *77332* | *8O* | *PDP Steps 7 & 8 (See PID 77510)* | *Wed 7/5/06* | *Tue 12/19/06* |
| 70 | 77332 | 4D | Design (PDP 9-12) | Wed 6/6/07 | Tue 1/15/08 |
| 71 | 77332 | 6C | Bid | Thu 3/24/11 | Wed 6/15/11 |
| 72 | 77332 | 6C | Construction | Mon 7/4/11 | Fri 11/16/12 |
| 73 | 77332 | 7CA | Construction Admin. | Mon 7/4/11 | Fri 11/16/12 |
| 74 | 25795 | | **Central Innerbelt** | **Tue 7/1/08** | **Wed 2/10/16** |
| 75 | 25795 | | **I-77 Access & Widening** | **Tue 7/1/08** | **Fri 11/15/13** |
| 76 | *25795* | *8O* | *PDP Steps 7 & 8 (See PID 77510)* | *Tue 7/1/08* | *Mon 10/20/08* |
| 77 | 25795 | 4D | Design (PDP 9-12) | Tue 4/7/09 | Mon 3/8/10 |
| 78 | 25795 | 5R | R/W(Utilities) | Tue 1/12/10 | Mon 12/13/10 |



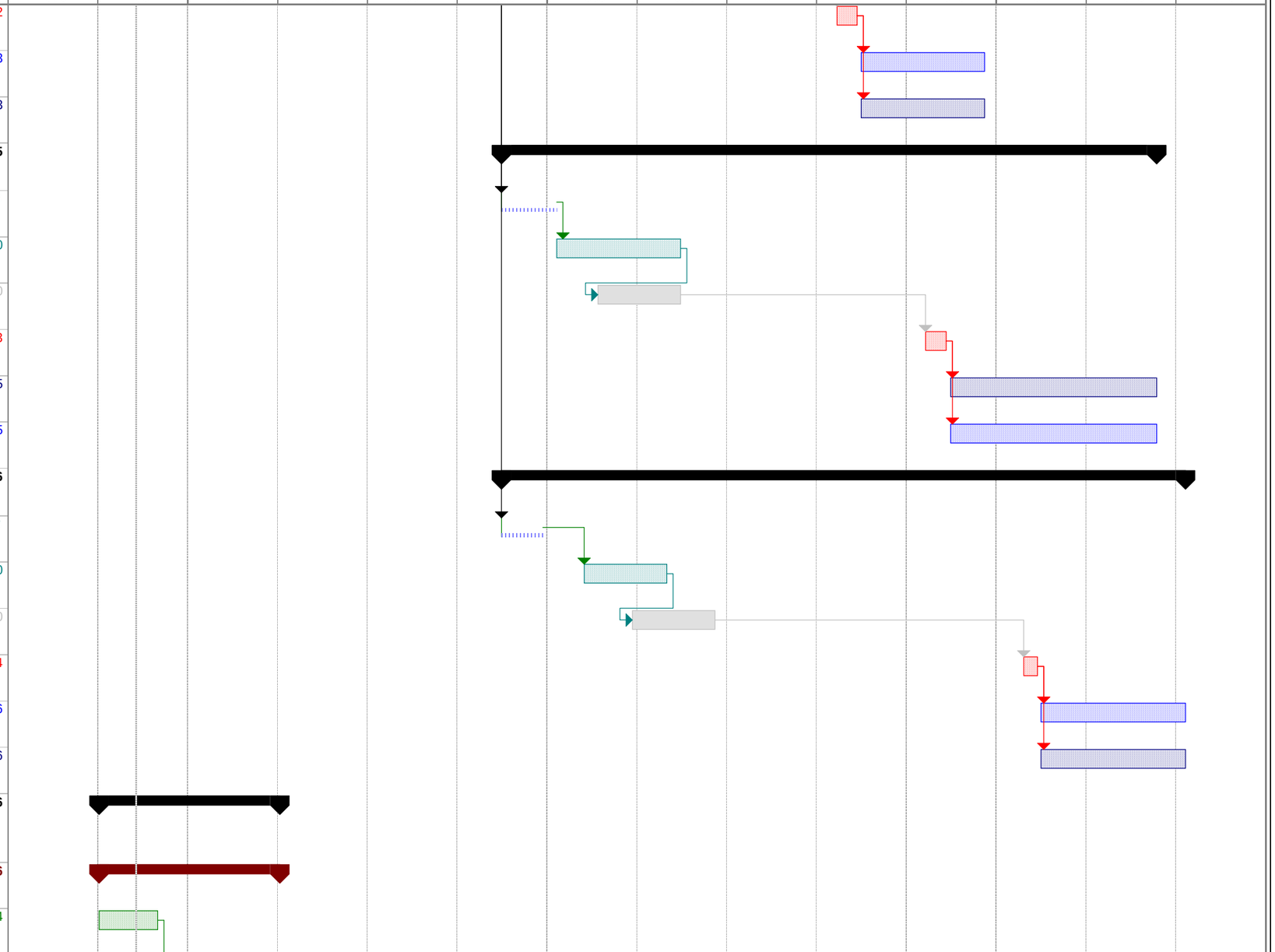

**Project: Cleveland Innerbelt (Basic)**
**Date: Thu 6/3/04**

BURGESS & NIPLE

| | | | | | |
|---|---|---|---|---|---|
| Task | Summary | Rolled Up Progress | Project Summary |
| Progress | Rolled Up Task | Split | Group By Summary |
| Milestone | Rolled Up Milestone | External Tasks | |

# *Innerbelt Strategic Plan Schedule*

| ID | PID | Type | Task Name | Start | Finish |
|---|---|---|---|---|---|
| 79 | 25795 | 6C | Bid | Mon 3/26/12 | Fri 6/15/12 |
| 80 | 25795 | 6C | Construction | Mon 7/2/12 | Fri 11/15/13 |
| 81 | 25795 | 7CA | Construction Admin. | Mon 7/2/12 | Fri 11/15/13 |
| 82 | 25795 | | **Central Interchange** | **Tue 7/1/08** | **Fri 10/16/15** |
| 83 | *25795* | *8O* | *PDP Steps 7 & 8 (See PID 77510)* | *Tue 7/1/08* | *Mon 2/9/09* |
| 84 | 25795 | 4D | Design (PDP 9-12) | Tue 2/10/09 | Mon 6/28/10 |
| 85 | 25795 | 5R | R/W(Utilities) | Tue 7/28/09 | Mon 6/28/10 |
| 86 | 25795 | 6C | Bid | Thu 3/21/13 | Wed 6/12/13 |
| 87 | 25795 | 7CA | Construction Admin. | Mon 7/1/13 | Fri 10/16/15 |
| 88 | 25795 | 6C | Construction | Mon 7/1/13 | Fri 10/16/15 |
| 89 | 25795 | | **Innerebelt Trench** | **Tue 7/1/08** | **Wed 2/10/16** |
| 90 | *25795* | *8O* | *PDP Steps 7 & 8 (See PID 77510)* | *Tue 7/1/08* | *Mon 12/15/08* |
| 91 | 25795 | 4D | Design (PDP 9-12) | Tue 6/2/09 | Mon 5/3/10 |
| 92 | 25795 | 5R | R/W(Utilities) | Tue 12/15/09 | Mon 11/15/10 |
| 93 | 25795 | 6C | Bid | Thu 4/24/14 | Wed 6/18/14 |
| 94 | 25795 | 6C | Construction | Thu 7/3/14 | Wed 2/10/16 |
| 95 | 25795 | 7CA | Construction Admin. | Thu 7/3/14 | Wed 2/10/16 |
| 96 | 77333 | | **Other Projects** | **Thu 1/8/04** | **Wed 1/11/06** |
| 97 | 77333 | | **University Boulevard** | **Thu 1/8/04** | **Wed 1/11/06** |
| 98 | 77333 | 8O | Consultant Procurement | Thu 1/8/04 | Wed 9/1/04 |




**Project: Cleveland Innerbelt (Basic)**
**Date: Thu 6/3/04**

BURGESS & NIPLE

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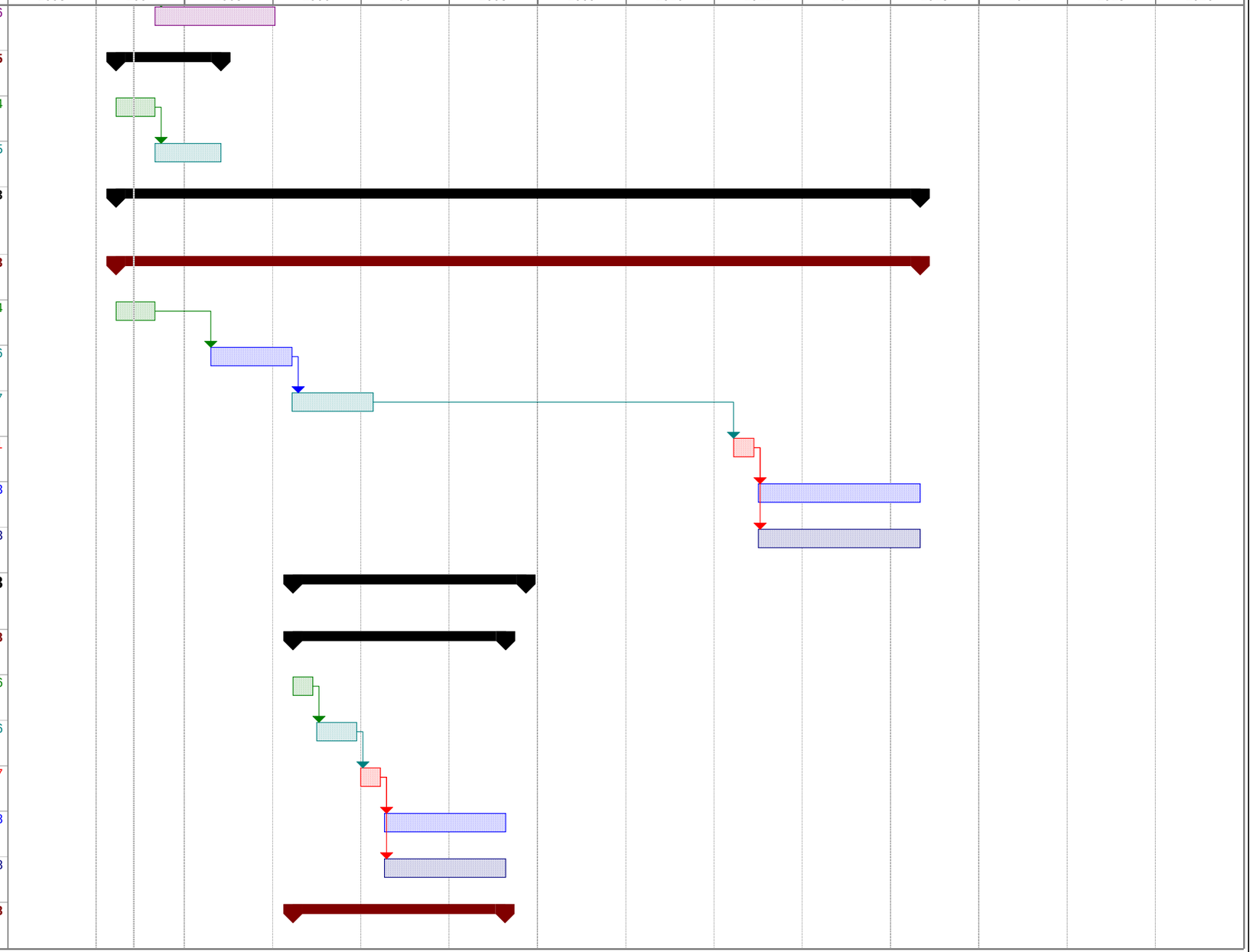
|---|---|---|---|---|---|
| Task | Summary | Rolled Up Progress | Project Summary |
| Progress | Rolled Up Task | Split | Group By Summary |
| Milestone | Rolled Up Milestone | External Tasks | |

# *Innerbelt Strategic Plan Schedule*

| ID | PID | Type | Task Name | Start | Finish |
|---|---|---|---|---|---|
| 99 | 77333 | 1P | Steps 5-6 NEPA | Thu 9/2/04 | Wed 1/11/06 |
| 100 | 77334 | | **CRVCIC Flats Connector** | **Thu 3/25/04** | **Wed 6/1/05** |
| 101 | 77334 | 8O | Consultant Procurement | Thu 3/25/04 | Wed 9/1/04 |
| 102 | 77334 | 1P | Steps 5-6 NEPA | Thu 9/2/04 | Wed 6/1/05 |
| 103 | | | **DTM/TSM** | **Thu 3/25/04** | **Fri 5/3/13** |
| 104 | 77331 | | **ITS (1) Arterial Management System** | **Thu 3/25/04** | **Fri 5/3/13** |
| 105 | 77331 | 8O | Consultant Procurement | Thu 3/25/04 | Wed 9/1/04 |
| 106 | 77331 | 1P | PDP Steps 7 & 8 (Stage 1 Design) | Thu 4/21/05 | Wed 3/22/06 |
| 107 | 77331 | 4D | Design (PDP 9-14) | Thu 3/23/06 | Wed 2/21/07 |
| 108 | 77331 | 6C | Bid | Thu 3/24/11 | Wed 6/15/11 |
| 109 | 77331 | 6C | Construction | Mon 7/4/11 | Fri 5/3/13 |
| 110 | 77331 | 7CA | Construction Admin. | Mon 7/4/11 | Fri 5/3/13 |
| 111 | | | **RTA Transit** | **Mon 3/27/06** | **Fri 11/14/08** |
| 112 | | | **Westlake Park-N-Ride Expansion** | **Mon 3/27/06** | **Fri 8/22/08** |
| 113 | | 8O | Consultant Procurement | Mon 3/27/06 | Fri 6/16/06 |
| 114 | | 4D | Design | Mon 7/3/06 | Fri 12/15/06 |
| 115 | | 6C | Bid | Mon 1/1/07 | Fri 3/23/07 |
| 116 | | 6C | Construction | Mon 4/9/07 | Fri 8/22/08 |
| 117 | | 7CA | Construction Admin. | Mon 4/9/07 | Fri 8/22/08 |
| 118 | | | **Strongsville Park-N-Ride Expansion (300 Spaces)** | **Mon 3/27/06** | **Wed 8/20/08** |



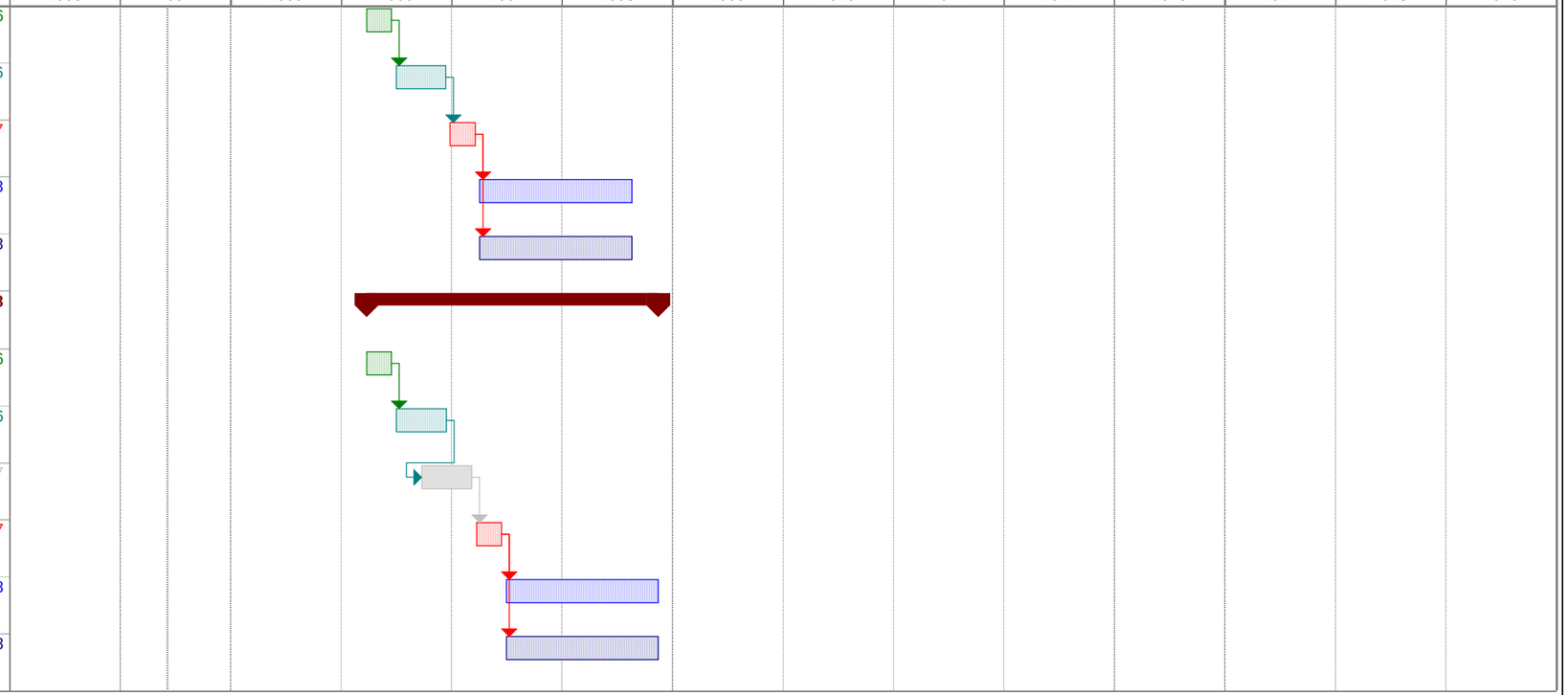

**Project: Cleveland Innerbelt (Basic)**
**Date: Thu 6/3/04**

BURGESS & NIPLE

| | | | | | |
|---|---|---|---|---|---|
| Task | Summary | Rolled Up Progress | Project Summary |
| Progress | Rolled Up Task | Split | Group By Summary |
| Milestone | Rolled Up Milestone | External Tasks | |

# *Innerbelt Strategic Plan Schedule*

| ID | PID | Type | Task Name | Start | Finish |
|---|---|---|---|---|---|
| 119 | | 8O | Consultant Procurement | Mon 3/27/06 | Fri 6/16/06 |
| 120 | | 4D | Design | Mon 7/3/06 | Wed 12/13/06 |
| 121 | | 6C | Bid | Wed 12/27/06 | Wed 3/21/07 |
| 122 | | 6C | Construction | Wed 4/4/07 | Wed 8/20/08 |
| 123 | | 7CA | Construction Admin. | Wed 4/4/07 | Wed 8/20/08 |
| 124 | | | **North Olmsted Park-N-Ride Expansion** | **Mon 3/27/06** | **Fri 11/14/08** |
| 125 | | 8O | Consultant Procurement | Mon 3/27/06 | Fri 6/16/06 |
| 126 | | 4D | Design | Mon 7/3/06 | Fri 12/15/06 |
| 127 | | 6R | R/W Acquisition | Mon 9/25/06 | Fri 3/9/07 |
| 128 | | 6C | Bid | Mon 3/26/07 | Fri 6/15/07 |
| 129 | | 6C | Construction | Mon 7/2/07 | Fri 11/14/08 |
| 130 | | 7CA | Construction Admin. | Mon 7/2/07 | Fri 11/14/08 |




**Project: Cleveland Innerbelt (Basic)**
**Date: Thu 6/3/04**

BURGESS & NIPLE

| | | | | | |
|---|---|---|---|---|---|
| Task | Summary | Rolled Up Progress | Project Summary |
| Progress | Rolled Up Task | Split | Group By Summary |
| Milestone | Rolled Up Milestone | External Tasks | |

# APPENDIX A
# Project Area Description

# APPENDIX A PROJECT AREA DESCRIPTION

This appendix describes the Innerbelt Facility and the additional area within the project termini.

## A.1 Innerbelt I-71 Northbound/I-90 Eastbound Travel Lanes (described from south to north termini)

South of the southern project terminus, I-71 and Fulton Road consist of four northbound traffic lanes. Along this section of roadway, the #4 (far right) travel lane changes over to a dedicated exit lane for a collector-distributor (C-D) roadway. The C-D lane continues north, parallel to I-71, providing access to both Fulton Road and West 25th Street, as shown on Figure A-1 and in Photograph 1. Consequently, the Fulton Road and West 25th Street interchanges are interrelated and function together. At Fulton Road, the mainline I-71 consists of three northbound through-traffic lanes that continue north past West 25th Street in a section of roadway known locally as the Metro Health Hospital Curve (Metro Curve). Just north of West 25th Street, the C-D lane reenters I-71, and I-71 again consists of four traffic lanes, as shown on Figure A-1 and in Photograph 1. At this point, lanes #1 and #2 are used for through traffic continuing north towards downtown Cleveland. Lanes #3 and #4 function as "exit only" lanes or drop lanes. Lane #4 is used by traffic exiting to West 14th Street, and lane #3 is used by traffic exiting to eastbound I-490/westbound I-90, as shown in Photograph 2. This exit allows West 14th Street to be used as a cut-through route for traffic attempting to avoid the congestion, since West 14th Street reenters the Innerbelt near downtown. The cut-through traffic is a major concern of the neighborhood. The Metro Curve is a weave section of roadway where I-71 traffic merging to the West 14th Street and I-90/I-490 exit lanes must weave through traffic entering from the Fulton Road/West 25th Street C-D lane trying to merge over to lanes #1 and #2. Just north of the Metro Curve, traffic from the Jennings Freeway merges into I-71. I-71 continues north in a two-lane section of roadway to the I-71/I-90/I-490 interchange where I-71 ends, as seen on Figure A-1, and in Photographs 3 and 4.

North of the I-71/I-90/I-490 interchange the two lanes from I-71 combine with two lanes from I-90 and proceed northeast along I-90 in a four-lane section of roadway over the Central Viaduct Bridge, as seen on Figures A-1 and A-2 and in Photograph 5. An entrance ramp near the west end of the Central Viaduct Bridge provides access to I-90 eastbound from West 14th Street (Photograph 6). The Central Viaduct Bridge then crosses the Cuyahoga River and the Industrial Valley, as shown in Photograph 7. Prior to the bridge's touchdown on the east side of the Cuyahoga Valley, the #4 lane provides access to southbound Broadway Avenue via an on-structure exit ramp. After crossing over Broadway Avenue, the #4 lane also provides an exit to northbound Broadway Avenue/Ontario Street via a loop ramp. From this point, the #4 lane is an exit-only lane or drop lane to northbound East 9th Street, as well as southbound I-77 (Photograph 8). I-90 continues east in a three-lane section to where a single lane from I-77 merges into I-90 (Photograph 9). The I-90EB/I-77NB interchange is another weave section. At this point, traffic from I-77 is merging into the #3 lane of I-90, while traffic in the #3 lane is merging to access the East 22nd Street exit along a very short section of roadway. From this point, I-90 turns north along a section of roadway known as the Carnegie Curve and continues

north along the eastern edge of downtown Cleveland in a trench section of freeway, as shown on Figure A-2 and in Photographs 10 and 11. In the trenched section of the Innerbelt, access to city streets is provided via exit ramps at Carnegie Avenue, Chester Avenue, Superior Avenue, and Lakeside Avenue. Access to I-90 eastbound is provided by entrance ramps at Prospect Avenue, Chester Avenue, Superior Avenue and St. Clair Avenue. A fourth lane is added to eastbound I-90 at the Superior Avenue entrance ramp that eventually becomes a drop lane to the ramp for westbound SR-2. I-90 continues north through the Innerbelt Curve (Photograph 12) to the I-90/SR-2 interchange (Photograph 13), the northern project terminus.

There is a total of eight bridges on the mainline Innerbelt between Fulton Road and the I-90/SR-2 interchange. A high percentage of the Innerbelt roadway between the Metro Curve and the Central Interchange is constructed on structure. Beginning with the I-71 bridge over the Jennings Freeway and including Innerbelt bridges over I-90/I-490, Starkweather Avenue and Kennilworth Avenue and the Central Viaduct Bridge, approximately 7,690 feet (1.45 miles) of roadway is constructed on bridge structure. With the length of this roadway section totaling 14,168 feet (2.68 miles) over one-half of the roadway is located on structure south of the Central Interchange. Within the Central Interchange there are four sets of bridges crossing over Broadway Avenue/Ontario Street, East 9th Street, the I-77 ramps under I-90, and East 14th Street. The overall length of these four structures is 1,139 feet. There are no mainline Innerbelt bridges north of the Central Interchange. The northbound I-71/eastbound I-90 Innerbelt has a total length of approximately 5.2 miles (27,456 feet) containing a total length of structures of 1.7 miles (8,829 feet) with pavement ranging from two to four lanes in width.

### A.2 Innerbelt I-90 Westbound and I-71 Southbound Travel Lanes (described from north to south termini)

East of the northern project terminus (the SR-2/I-90 interchange) I-90 consists of four westbound travel lanes, as shown in Photograph 13. At the interchange, lanes #3 and #4 continue west as SR-2, and lanes #1 and #2 curve south through the Innerbelt Curve and continue as I-90, as shown on Figure A-2. Just south of the Innerbelt Curve (Photograph 12), two eastbound lanes from SR-2 enter onto I-90 forming three westbound through-travel lanes and a weave lane. Lane #4 in this area becomes an "exit only" or drop lane to Superior Avenue. The Lakeside Avenue entrance ramp to I-90 from Lakeside Avenue/East 26th Street enters the Innerbelt within this short weave section. From this point, I-90 continues through the trench section of the Innerbelt as a three-lane roadway, as shown on Figure A-2 and in Photographs 10 and 11. In the trench section of the Innerbelt, there are three locations where motorists can exit the Innerbelt to city streets. These exits are located at Superior Avenue, Chester Avenue and Prospect Avenue. Within the trench, motorists may also enter the Innerbelt from city streets at Lakeside Avenue/East 26th Street just north of Lakeside Avenue, Superior Avenue, Chester Avenue/East 24th Street, and Prospect Avenue. The acceleration and deceleration lanes of two closely spaced pairs of ramps form weave lanes in the westbound direction between (1) the Superior Avenue on-ramp and the Chester Avenue off-ramp, and (2) the Chester Avenue on-ramp and Prospect Avenue off-ramp. Leaving the trench area, the #3 lane provides access to I-77 southbound. The westbound I-90 traffic shares the same ramp to I-77 southbound as traffic using the East 21st Street entrance to I-77

southbound, as shown in Photographs 8 and 9. Traffic continues to enter the #3 lane from Innerbelt entrance ramps located at East 14th Street and East 9th Street. At the east end of the Central Viaduct, the Ontario Street entrance ramp is an add lane to the Innerbelt Bridge, as shown in Photograph 7. From this point, the westbound Innerbelt consists of four travel lanes across the Central Viaduct Bridge. Approaching the west end of the bridge is the Abbey Road exit to Abbey Road and West 14th Street at Fairfield Avenue. Continuing south, lane #4 becomes a drop lane to westbound I-90 (Photograph 6) at the I-90/I-71 split. At this point, the Innerbelt continues south, as I-71, in a three-lane roadway section across the I-71/I-90/I-490 interchange, as shown in Photographs 3 and 4. Just south of the interchange, two lanes from I-490 westbound and one lane from I-90 eastbound funnel into a 2-lane C-D road that runs parallel to the west side of I-71, as shown on Figure A-2 and in Photograph 2. At the Metro Curve, a lane of traffic from the C-D road exits to the #3 lane of I-71. In the middle of the Metro Curve, traffic can exit the Innerbelt to the West 25th Street/Fulton Road C-D road from the #3 lane and to the Jennings Freeway southbound from the #1 lane. From this point, the Innerbelt continues south as a 3-lane roadway section to the south project terminus near Fulton Avenue where the C-D road rejoins I-71 creating a 4-lane roadway south of Fulton Road, as shown in Photograph 1.

There is a total of seven mainline bridges on the southbound Innerbelt between the SR-2/I-90 interchange and Fulton Road. All bridges are located between the Central Interchange and the Metro Curve. Innerbelt bridges over I-90/I-490, Starkweather Avenue, Kennilworth Avenue and the Central Viaduct Bridge are approximately 5,892 feet (1.12 miles) of combined length. With the length of this roadway section totaling 14,168 feet (2.68 miles), over one-third of the roadway in this section is located on structure. Within the Central Interchange there are four sets of bridges crossing over Broadway Avenue/Ontario Street, East 9th Street, the I-77 ramps under I-90, and East 14th Street. The overall length of these four structures is 1,139 feet. The westbound I-90/southbound I-71 Innerbelt Facility has a total length of approximately 5.2 miles (27,456 feet) containing a total length of structures of 1.3 miles (7,031 feet) with pavement ranging from two to four lanes in width.

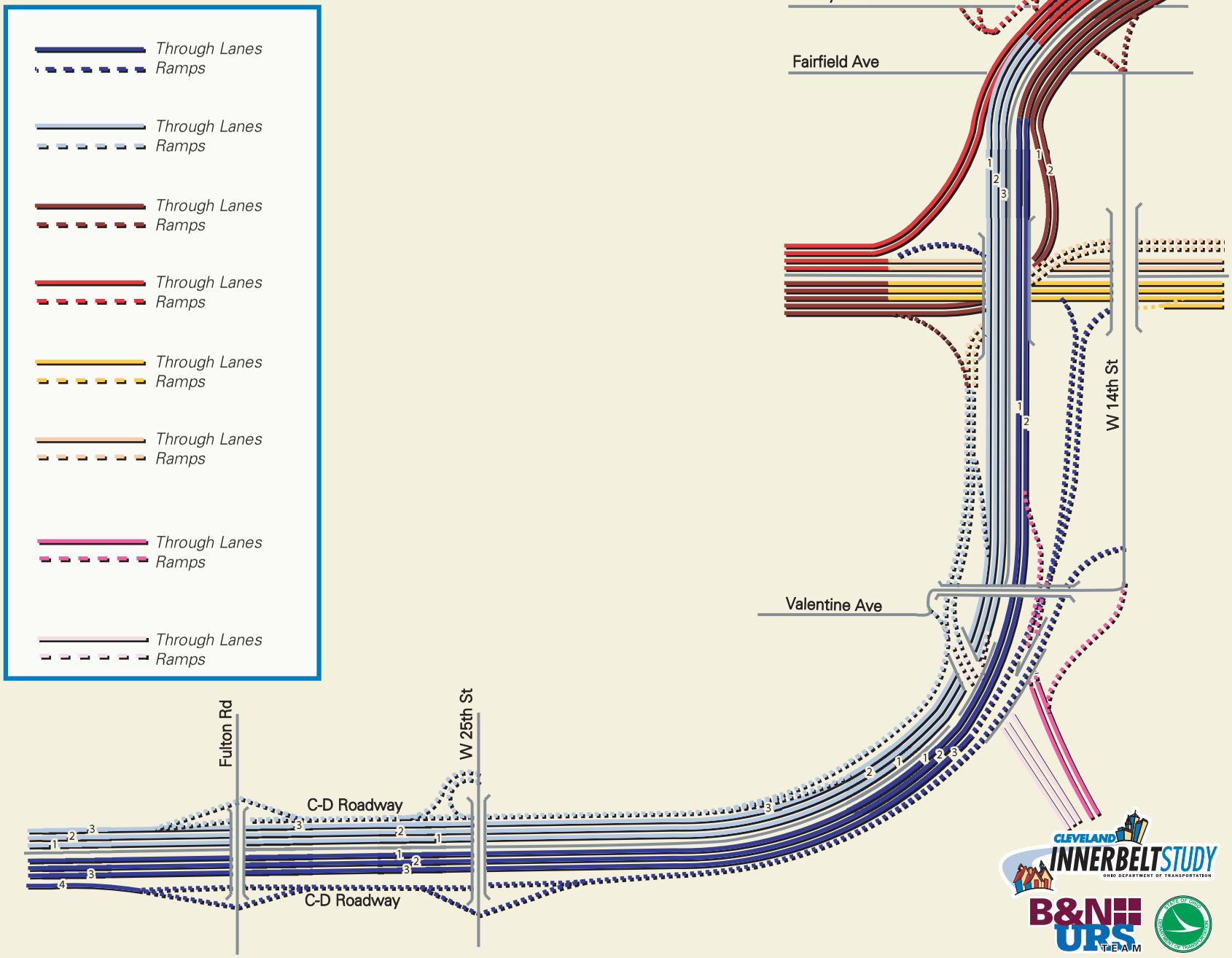
## A.3 Central Interchange

An important component of the Innerbelt is the Central Interchange. The Central Interchange is located roughly in a triangular-shaped area of land bounded on the southwest by Broadway Avenue/Orange Avenue, on the east by East 22nd Street, and on the north by Carnegie Avenue, as shown on Figure A-2 and in Photograph 8. Three distinct transportation functions occur within the Central Interchange: (1) interstate-to-interstate movement (System Interchange), (2) interstate to/from local roadway movement (Service Interchange), and (3) local-to-local roadway movement. Many of the exit and entrance points on I-90 serve dual purposes. Eastbound I-90 traffic can exit the Innerbelt at the Central Interchange to Broadway Avenue (southbound), Ontario Street (northbound), East 9th Street (northbound), I-77 (southbound), and East 22nd Street (northbound and southbound). I-90 westbound can exit to I-77; however, there are no I-90 westbound exits to city streets in the Central Interchange. Traffic from the Cleveland CBD may access I-90 westbound at East 21st Street, East 14th Street, East 9th Street and at Ontario Street. There is no local access to I-90 eastbound in the Central Interchange. The Central Interchange provides full directional access between I-90 and I-77. Northbound

traffic on I-77 can access the CBD via East 9th Street and Ontario Street, East 14th Street, East 18th Street, and East 22nd Street in the Central Interchange. CBD traffic can access I-77 southbound via East 14th Street, East 9th Street and Ontario Street via Broadway Avenue at the Central Interchange.

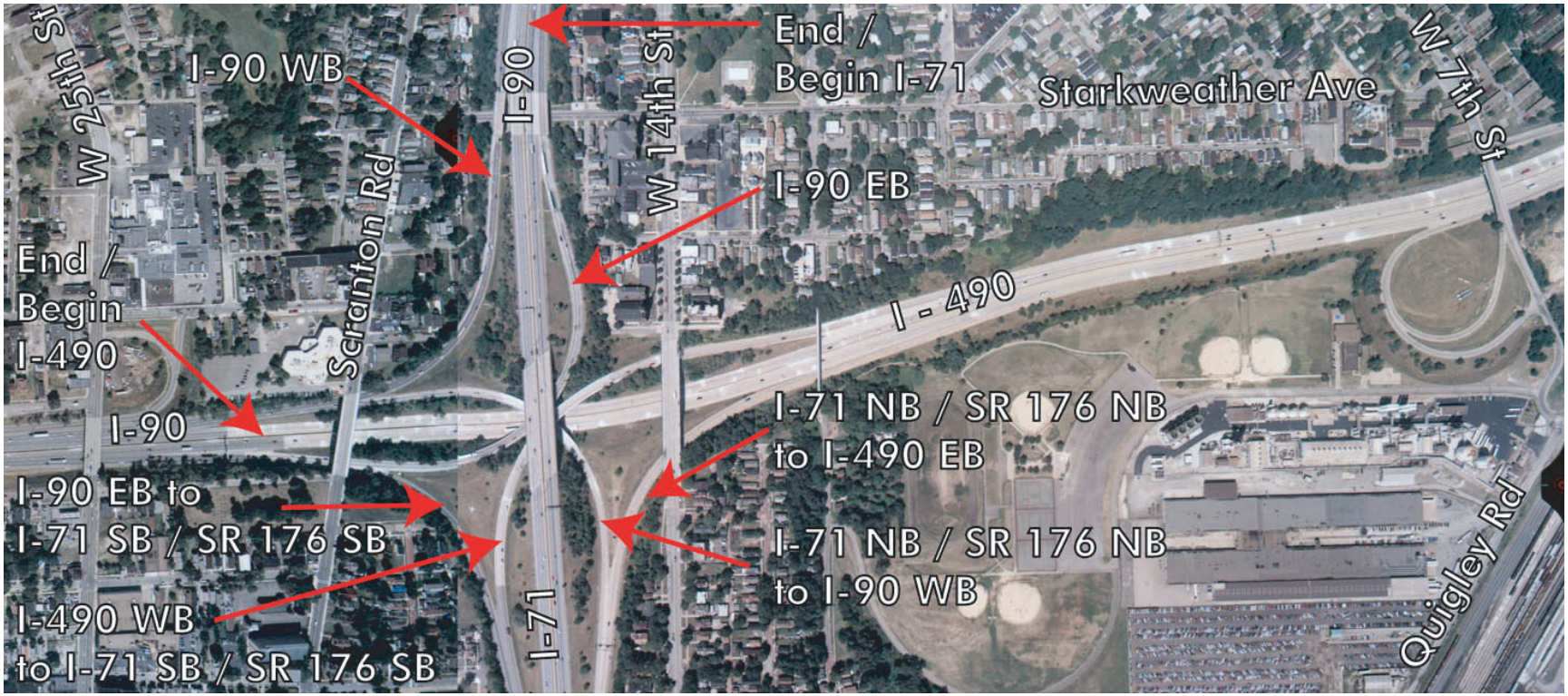
*FIGURE A-1:*

## *Southern Innerbelt Travel Lanes*




Photograph 1. I-71 from Fulton Rd to SR 176 merge


Photograph 2. I-71 - SR 176 merge to I-90 / I-490 Interchange

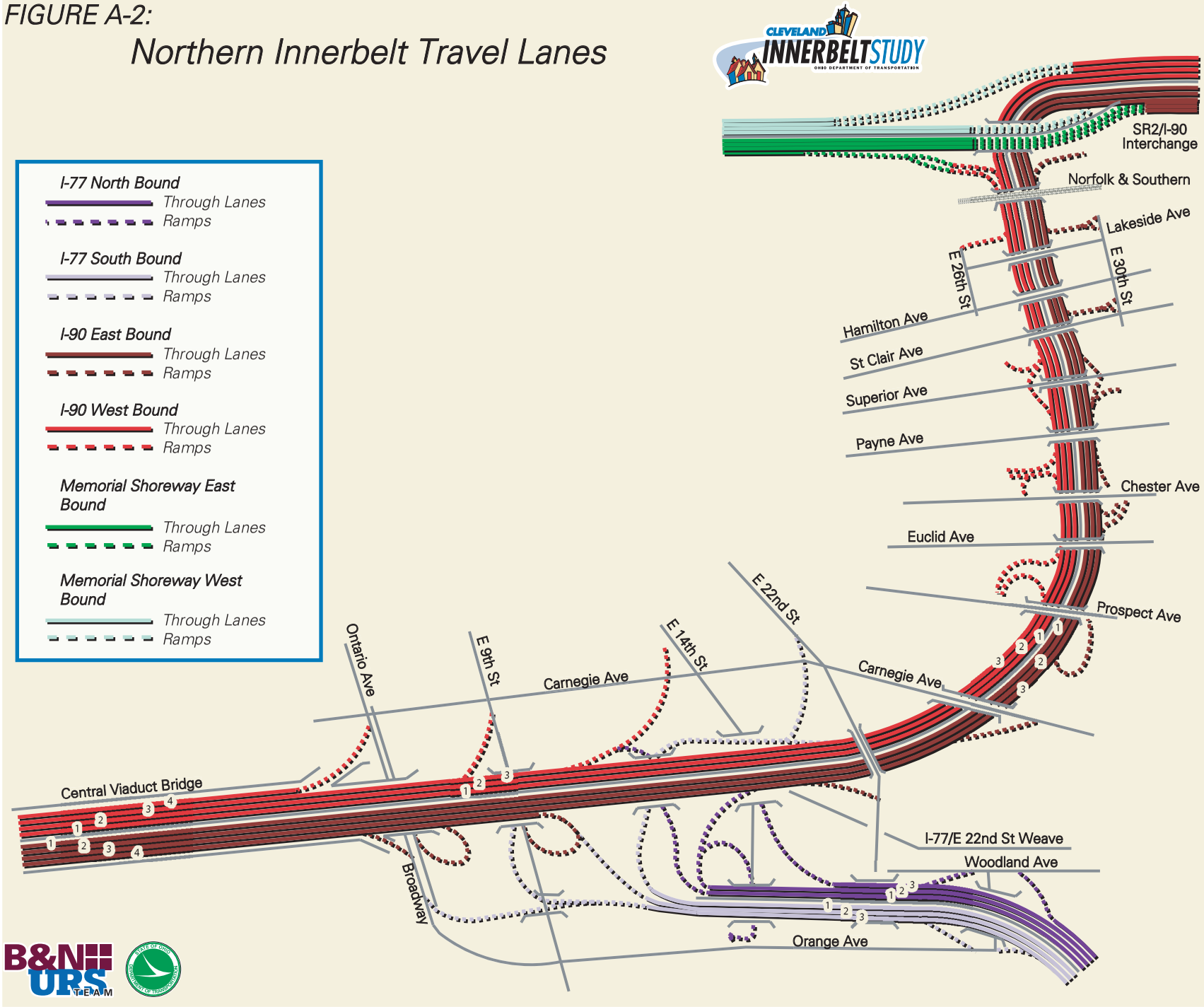


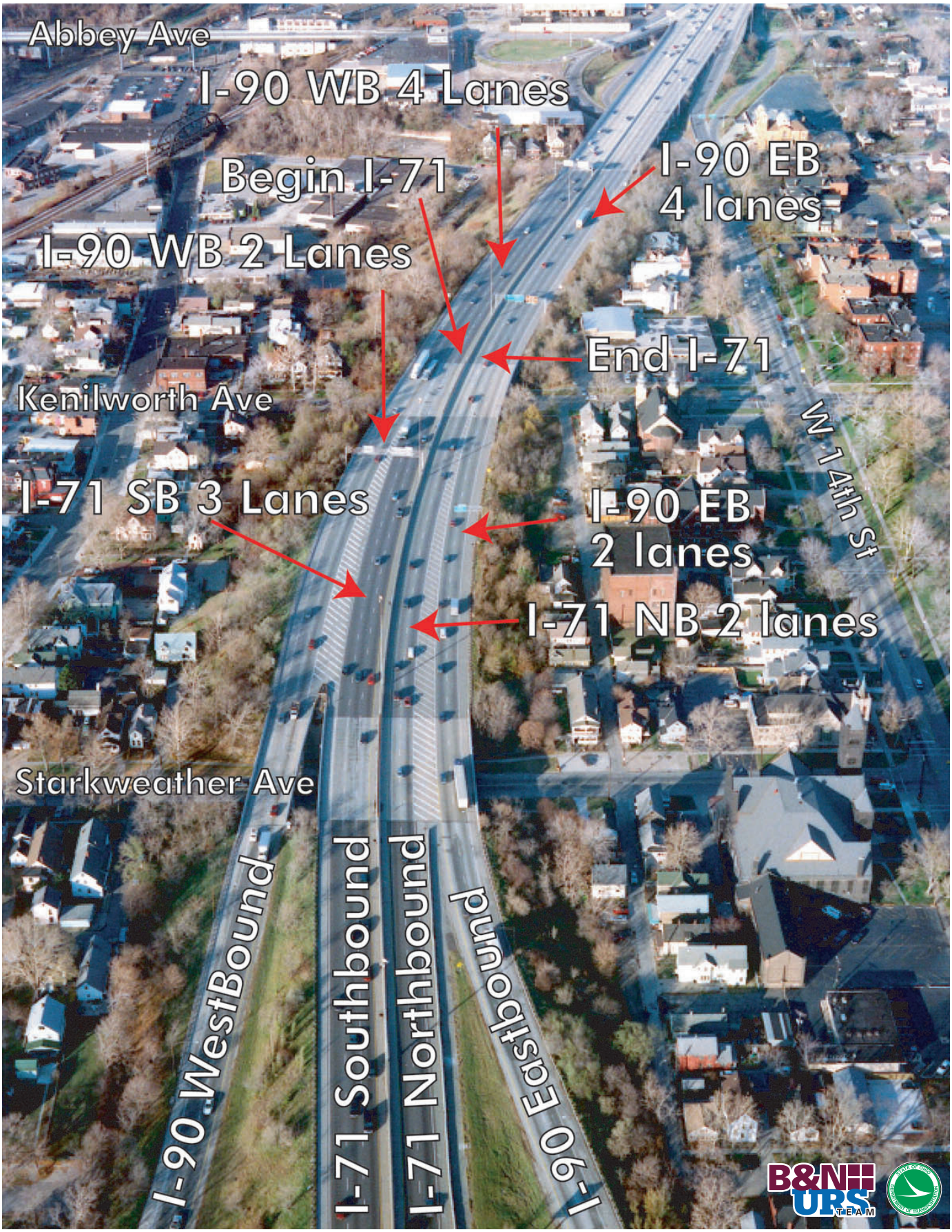

Photograph 3. I-90 and I-490 from W. 25th St. to W. 7th St.


Photograph 4. The I-71 / I-90 / I-490 interchange looking north.

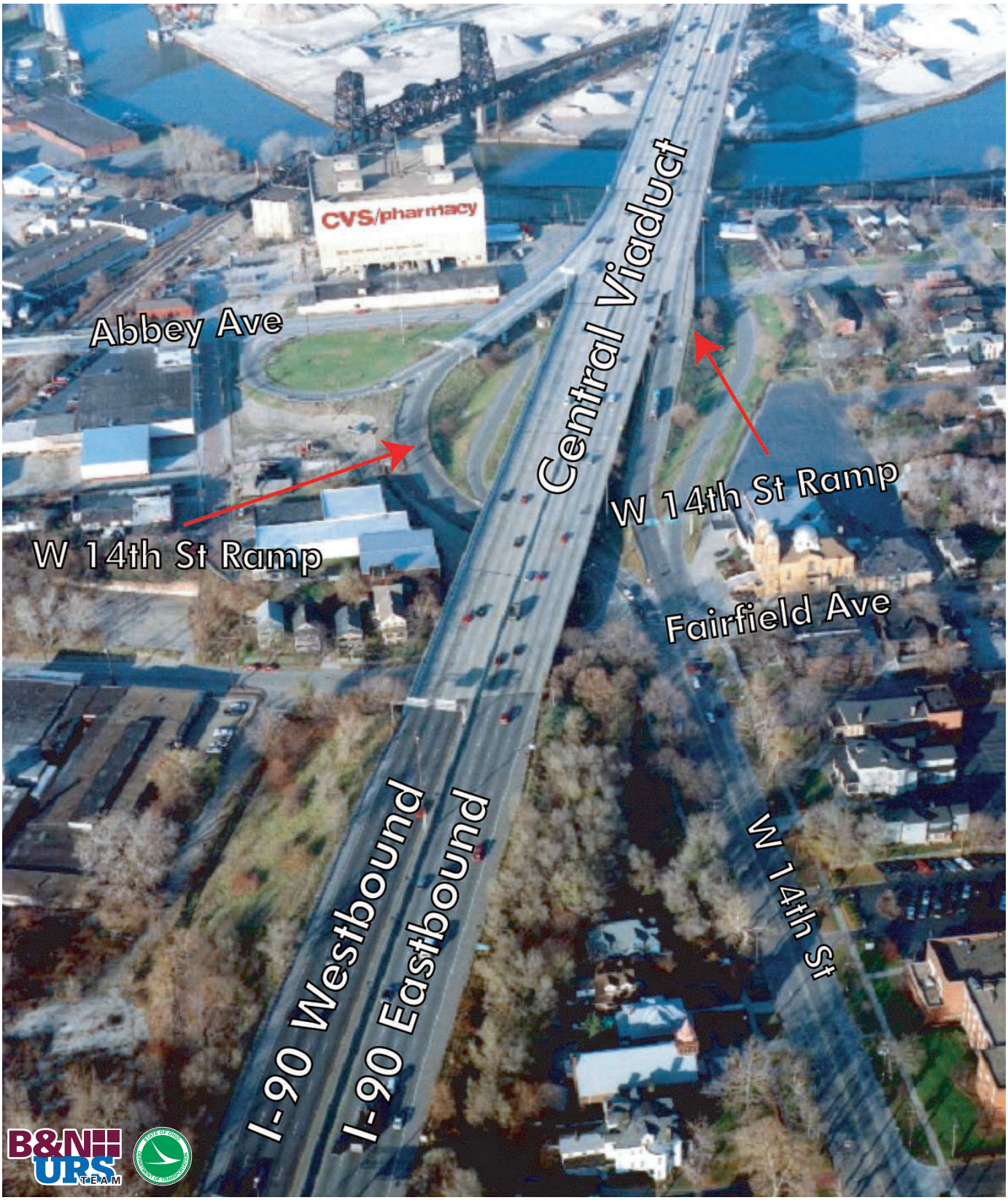
*FIGURE A-2:*

# *Northern Innerbelt Travel Lanes*

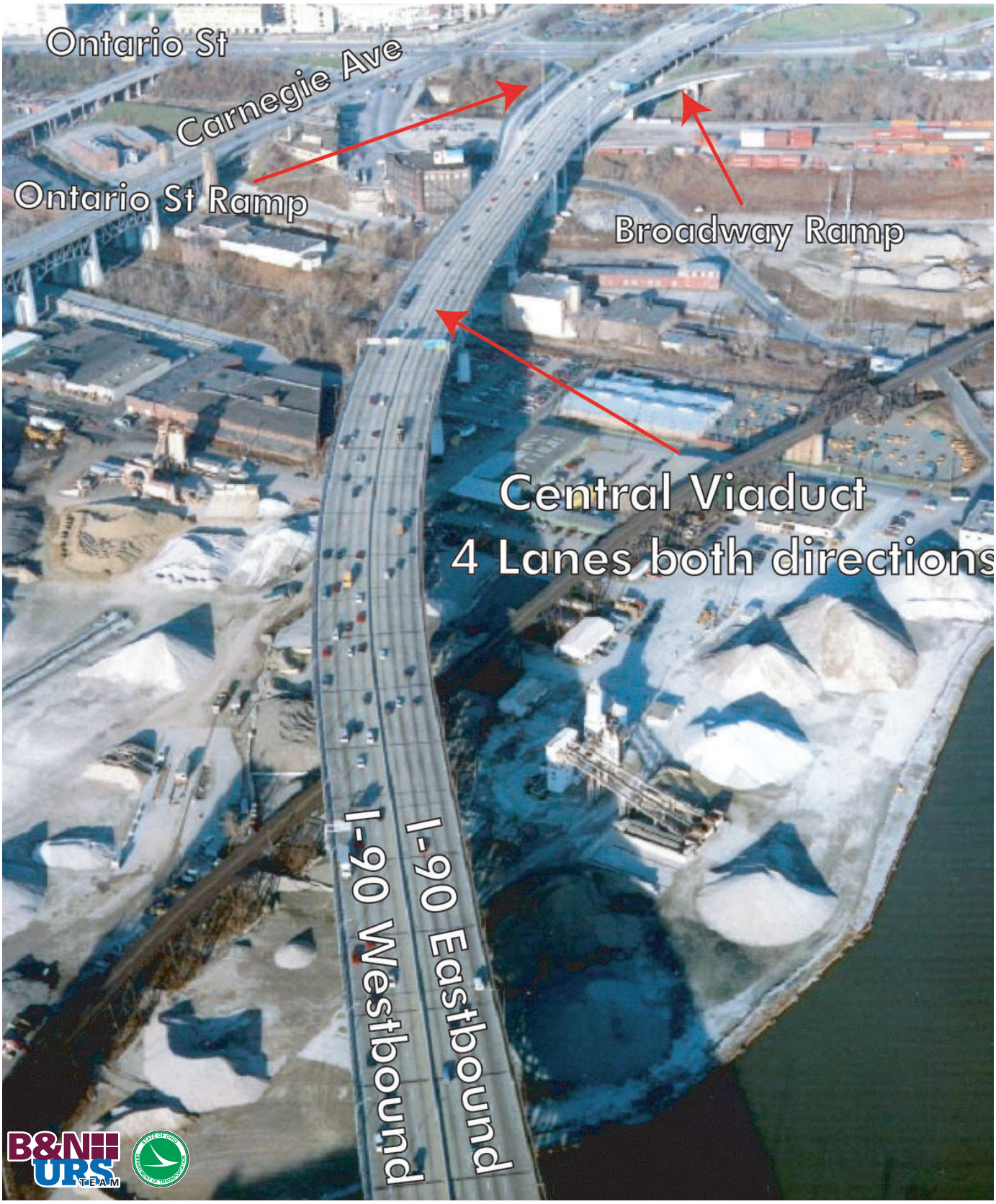




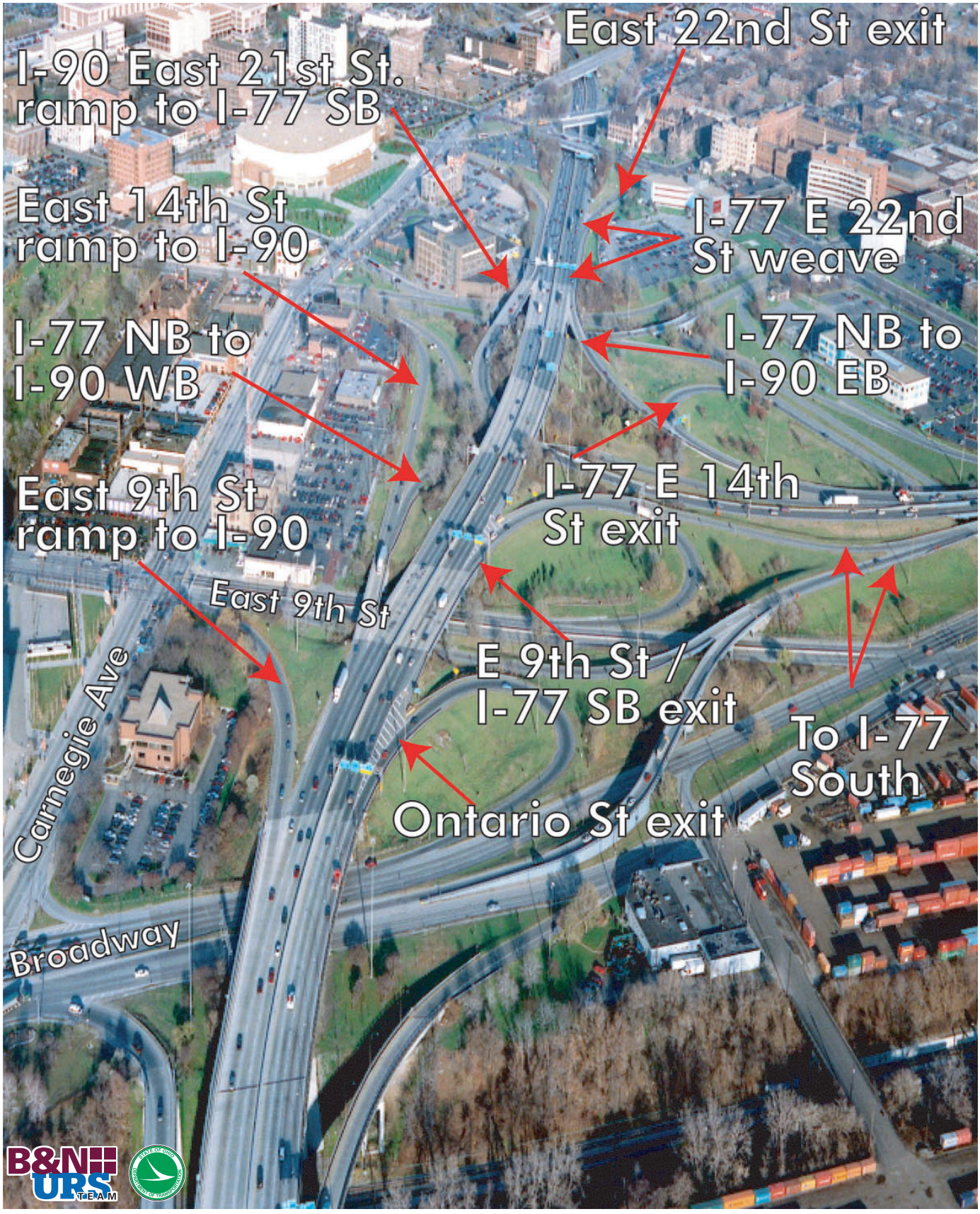

Photograph 5. The Innerbelt just north of the I-71 / I-90 / I-490 interchange looking north. The photograph also shows the end of northbound I-71 and the beginning of southbound I-71.



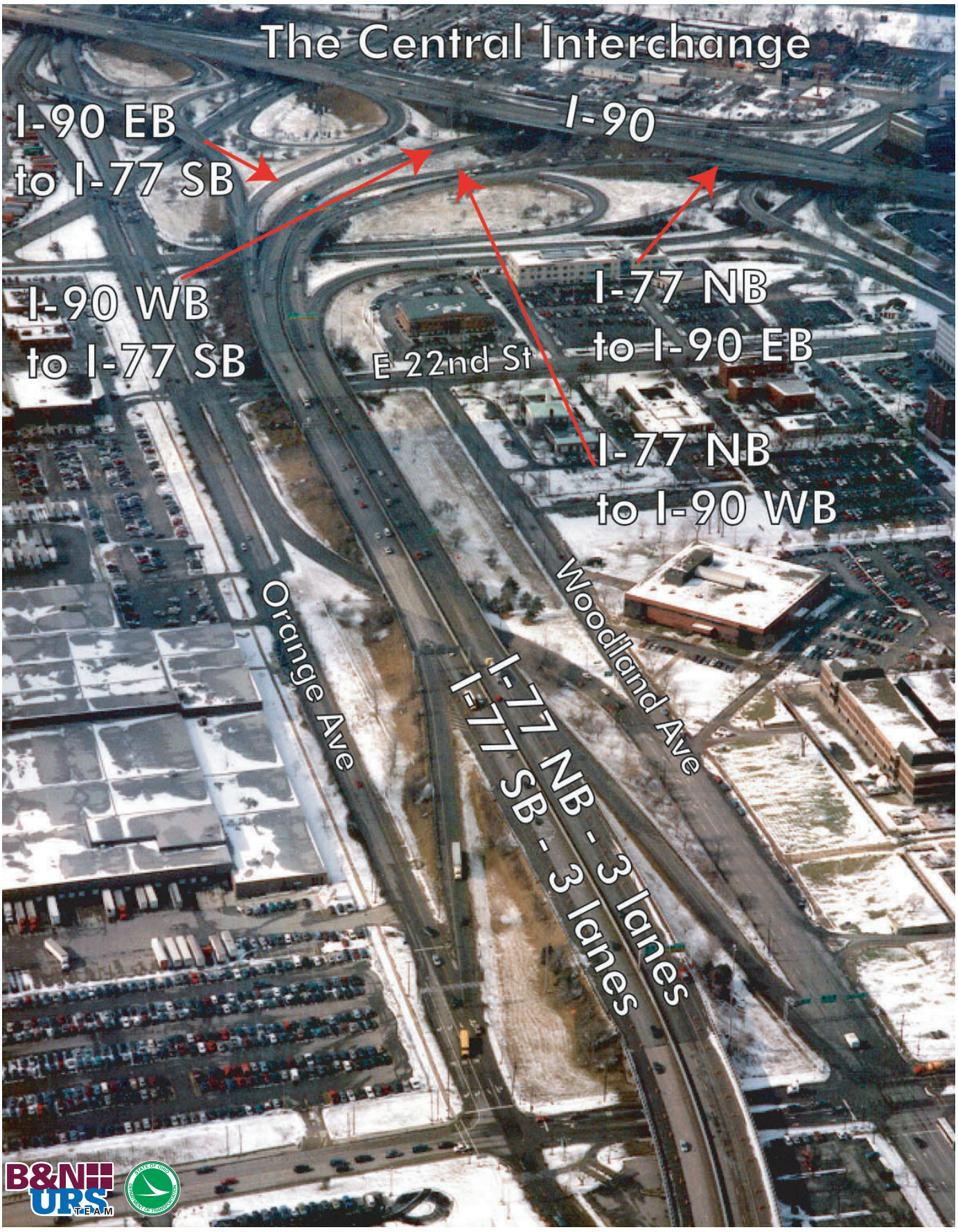

Photograph 6. Innerbelt showing the west end of the Central Viaduct as it crosses over the Cuyahoga River Valley. View is to the northeast.



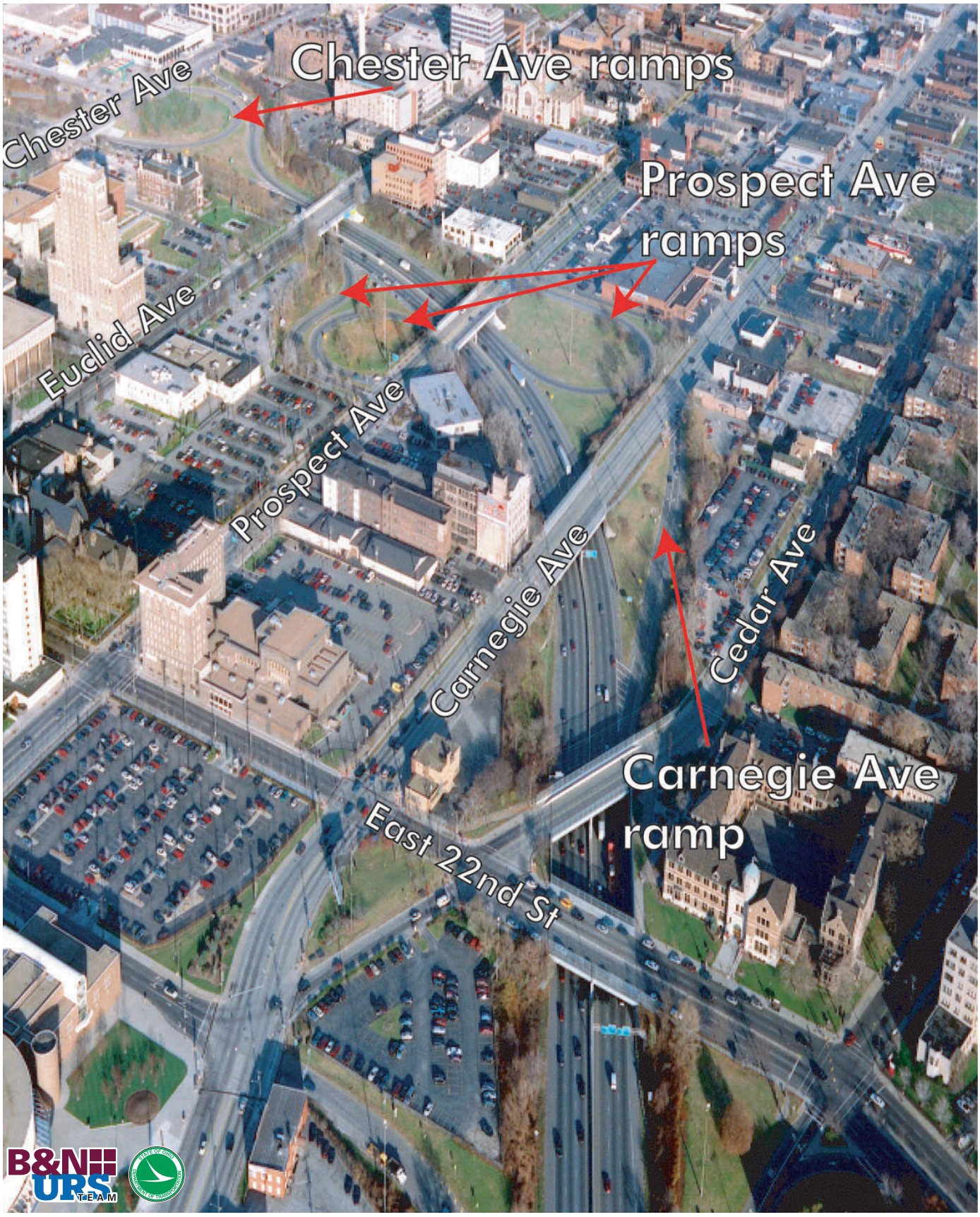

Photograph 7. Innerbelt showing the east end of the Central Viaduct as it crosses over the Cuyahoga River and Industrial Flats. The Central Interchange is seen at the top of the photograph. View is to the northeast.



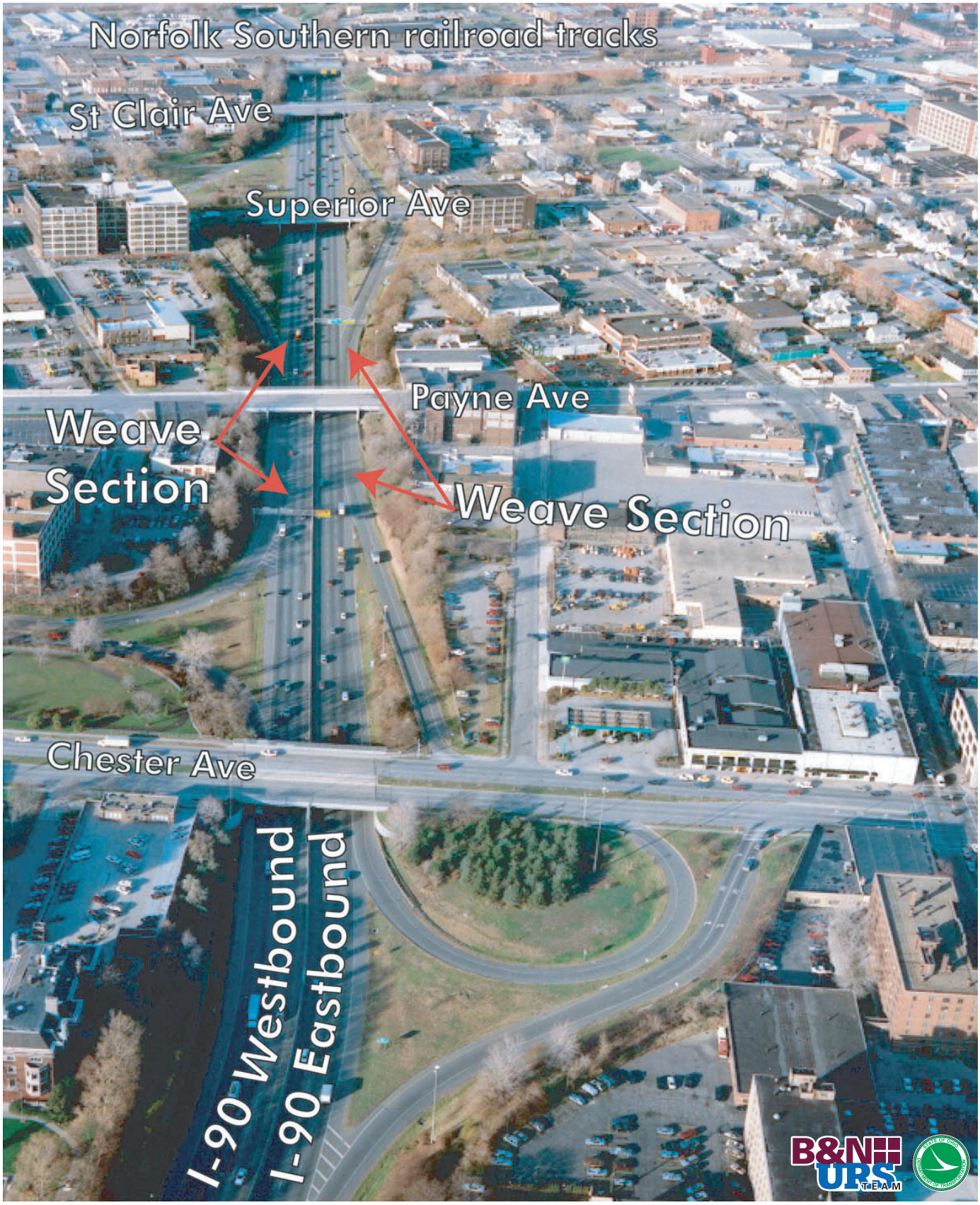

Photograph 8. The Innerbelt showing the Central Interchange. View is to the northeast. I-90 descends into the trench section of the Innerbelt at the top of the photograph.



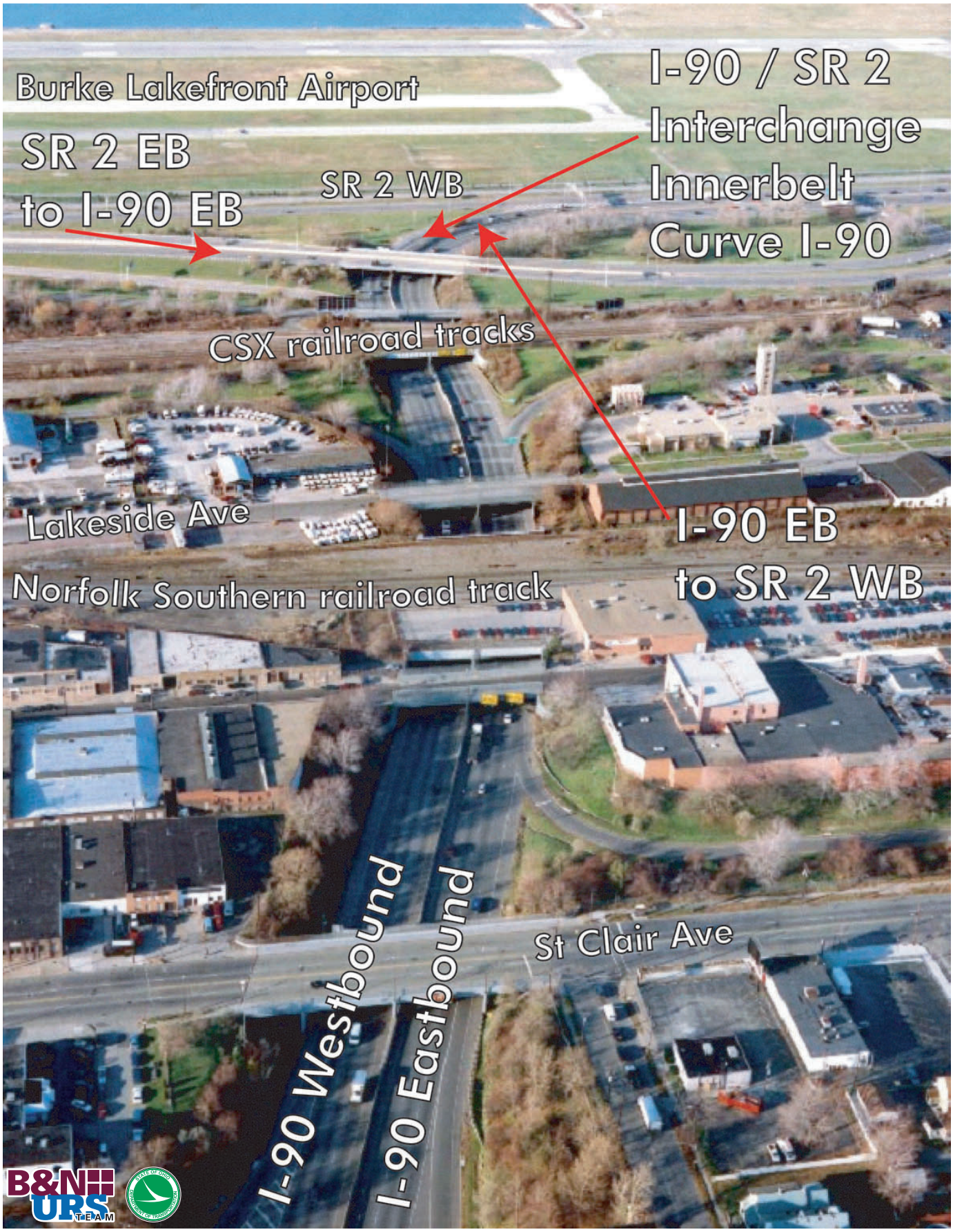

Photograph 9. A view of I-77 where it ends at the Central Interchange. View is to the northwest.




Photograph 10. The Innerbelt showing the south end of the trench section. View is to the northeast.




Photograph 11. The trench section of the Innerbelt looking north.




Photograph 12. The north section of the Innerbelt trench.


Photograph 13. I-90 - SR 2 Interchange west to East 9th St.

# APPENDIX B
# City of Cleveland Concerns

**CLEVELAND INNERBELT STUDY**
**Alternative Components**

| COMPONENT | MAJOR FINDINGS | ODOT RECOMMENDATION | CITY STAFF COMMENTS |
|---|---|---|---|
| **Collector-Distributor (C-D) Roadways (Fulton Road to West 25th Street)**<br>*Proposal:* Relocate C-D roadways to be directly adjacent to and at the same grade as the mainline (to reduce noise and visual impacts to adjacent residential properties). Landscape property resulting from the relocation of the C-D roadways to buffer residential properties. | From traffic operations and safety standpoints, there are no differences between C-D roadways at the top or bottom of the slope. | The cost to relocate the C-D roadways at the same time as I-71 is reconstructed would be less than the cost of relocating the C-D roadways project independently. Thus, it is recommended that at the time the mainline I-71 pavement between Fulton Road and West 25th Street is to be reconstructed, the C-D roadways should be relocated and reconstructed. | Relocation of the C-D roadways between Fulton Road and West 25th Street will provide a positive benefit to adjacent residential properties and should be pursued concurrently with the appropriate future time when the mainline I-71 pavement is reconstructed. |
| **Southern Innerbelt Improvements (Metro Health Curve to Central Viaduct Bridge)**<br>*Proposal:* Provide three travel lanes northbound continuously on I-71 between West 25th Street at the Metro Health Center Curve and I-90 and provide five travel lanes in each direction between the I-71/I-90 interchange and the Central Viaduct to minimize congestion and cut-through traffic on West 14th Street through the Tremont neighborhood. Reconfigure the interchange for Abbey Avenue at I-90 to meet current highway standards. | The existing lane imbalance in the Southern Innerbelt area produces severe traffic safety and operational impacts. During the AM peak period, the imbalance causes increased congestion resulting in increased crash rates. West 14th Street offers a convenient congestion by-pass, increasing traffic through the Tremont neighborhood. | 1. Central Viaduct Bridge: Widen both eastbound and west bound from 4 lanes to 5 lanes.<br><br>2. Abbey Avenue/I-90 Interchange Modifications: Modify entrance and exit ramps to provide standard lane tapering.<br><br>3. I-71/I-90 Increased Travel Lanes: Widen both eastbound and westbound I-90 roadways north of Kenilworth Avenue from four lanes to 5 lanes each. Provide a retaining wall where needed to eliminate any right-of-way takes. | 1. Central Viaduct Bridge: Currently people walk between the Tremont neighborhood and downtown using the emergency walkway along the Central Viaduct. Any widening or replacement of the Central Viaduct must accommodate pedestrian/bike paths linking downtown and the Tremont neighborhood.<br><br>2. Abbey Avenue/I-90 Interchange Modifications: The impacts of any ramp modifications to Greek Orthodox Church of the Annunciation must be fully identified and appropriate mitigating measures presented as part of the environmental documentation of this component of ODOT's Recommended Alternative.<br><br>The alignment of the exit ramp to Abbey from I-90 west should be configured to maximize development of property along Abbey Avenue and West 15th Street.<br><br>3. I-71/I-90 Increased Travel Lanes: It is understood that this widening will occur within ODOT's existing right-of-way, but it also will place traffic 12 feet closer to existing buildings. Given the close proximity of existing buildings to this right-of-way, the visual impacts and those related to noise, vibration and light from roadway fixtures located 12 feet closer to property lines must be fully identified and appropriate mitigating measures presented as part of the environmental documentation of this component of ODOT's Recommended Alternative.<br><br>The addition of travel lanes will lengthen underpasses at Kenilworth, Fairfield and Abbey avenues by approximately 24 feet. The character of these underpasses must be inviting for pedestrian and bicyclists traversing from one part of the Tremont neighborhood to the other.<br><br>Existing pedestrian bridges over interstates should be enhanced to encourage greater usage. |

| COMPONENT | MAJOR FINDINGS | ODOT RECOMMENDATION | CITY STAFF COMMENTS |
|---|---|---|---|
| **Cuyahoga River Valley Consolidated Intermodal Connector (CVRCIC)**<br>*Proposal:* Provide direct access between the interstate highway network and public and private docks along the lakefront and Cuyahoga River that serve as intermodal transfer facilities for bulk materials (primarily aggregates, cement, and salt) from ships to trucks to minimize truck traffic through upland neighborhoods, including Ohio City, Detroit Shoreway and Tremont, and the downtown commercial and visitor attractions at Tower City Center and the Gateway Sports Complex. | The dispersed locations of the intermodal facilities on both sides of the Cuyahoga River, the winding course of the river and the necessity of moveable bridges to provide vehicular access across the navigable channel at river level requires the CVRCIC to have several components addressing different access points for the region's interstate highway network. | 1. West Bank Connector: A new transportation spine would be constructed between River Avenue on the Main Avenue peninsula, that provides access to Whiskey Island via the Willow Street Lift Bridge, and West 3rd Street by building new roadway segments and rebuilding existing roadways to carry truck traffic generated by intermodal facilities along the west side of the Cuyahoga River. This route would minimize the number of crossings of moveable bridges and associated travel time delays necessary to provide access to the interstate highway network. It also would reduce truck traffic along other sensitive infrastructure, such as the Huron Road bridges over the Tower City Center retail space, and through residential and commercial concentrations.<br><br>2. Quigley Avenue Extension: West 3rd Street and Quigley Avenue would be reconstructed between the Cuyahoga River and Holmden Avenue with new pavement, curbing, drainage, signing and lighting and a new roadway would be constructed between Holmden Avenue and I-71 at the existing West 14th Street interchange along the ISG property. The West 14th Street/I-71 interchange would be reconfigured to a four-legged signalized intersection. This would provide direct truck access between I-71 and the Industrial Valley, bypassing the current route through the Tremont neighborhood that uses Clark Avenue and part of West 14th Street.<br><br>3. Commercial Road Hill Connection: To improve access between downtown and intermodal facilities along the east bank of the Cuyahoga River a new roadway configuration is being considered between West 3rd Street and the Central Interchange now served by Commercial Road Hill. This roadway would extend from West 3rd Street north of the lift bridge and follow existing Commercial Road to Canal Road then turn east parallel to the NS Railroad tracks and continue uphill to the Central Interchange in the vicinity of Broadway Avenue and East 14th Street.<br><br>4. West 7th Street/I-490 Interchange: A diamond type interchange would be constructed to allow access to all directions of the interstate highway network with the ramps braided in the I-71/I-90/I-490 interchange to minimize any potential conflicts between traffic movements, while still allowing access on I-490 to and from I-77.<br>***– OR –***<br>5. Jefferson Avenue Lift Bridge: Disbursed access would be provided between the West Bank Connector and the interstate highway network utilizing the existing West 7th/I-490, Broadway/I-490 and Broadway/I-77 interchanges by constructing a new low level lift bridge across the Cuyahoga River along the alignment of vacated Jefferson Avenue. A new roadway segment would be constructed between the proposed lift bridge and Broadway Avenue with an at-grade crossing of | 1. West Bank Connector: A new roadway segment must be extended under the NS Railroad tracks on Whiskey Island to provide truck access to intermodal facilities located on the north side of the island.<br><br>As appropriate for the Towpath Trail, a separate multi-purpose path must be included within the proposed public right-of-way from Whiskey Island to West 3rd Street.<br><br>2. Quigley Avenue Extension: As appropriate for the Towpath Trail, a separate multi-purpose path must be included within the proposed public right-of-way.<br><br>3. Commercial Road Hill Connection: Until such time as the Central Interchange is modified, truck access between the interstate highway network and intermodal facilities of the east bank of the Cuyahoga River, Commercial Road Hill must be maintained in its current alignment to the Ontario/Carnegie intersection.<br><br>Truck access between the interstate highway network and intermodal facilities along the Cuyahoga River must be fully integrated into the layout of the Central Interchange to minimize truck traffic movements along other sensitive infrastructure, such as the Huron Road bridges over the Tower City Center retail space, and through residential and commercial concentrations.<br><br>The alignment of the Commercial Road Hill Connection should not preclude the future use of the CSX Railroad tracks serving the Dominion East Ohio Steam Plant by the Cuyahoga Valley Scenic Railroad.<br><br>4. West 7th Street/I-490 Interchange: The aesthetic treatment of the interchange modifications must enhance the residential character of the Tremont neighborhood.<br><br>Existing pedestrian bridges over interstates should be enhanced to encourage greater usage.<br><br>Jefferson Avenue Lift Bridge: This proposed lift bridge is in close proximity to the existing West 3rd Street Lift Bridge and appears to provide unnecessary redundancy. The City discourages any further consideration of new lift bridges because of their annual maintenance and operating costs.<br><br>5. Jennings Road Extension: The alignment of this roadway segment should be extended as appropriate to encourage ttruck movements between industry in the the Lower Big Creek area and the interstate highway network. |

| COMPONENT | MAJOR FINDINGS | ODOT RECOMMENDATION | CITY STAFF COMMENTS |
|---|---|---|---|
| **Cuyahoga River Valley Consolidated Intermodal Connector (CVRCIC) (continued)** | | the existing CSX tracks serving the Dominion East Ohio Steam Plant on Canal Road north of Eagle Avenue. (This track may possibly be used by the Cuyahoga Valley Scenic Railroad if it is extended to downtown Cleveland.)<br>***– OR –***<br>East Bank Connector: Disbursed access would be provided between West 3rd Street Lift Bridge on the east side of the Cuyahoga River and the interstate highway network utilizing the existing West 7th/I-490, Broadway/I-490 and Broadway/I-77 interchanges by constructing a new roadway segment between West 3rd Street north of the lift bridge and Broadway Avenue in the vicinity of East 14th Street parallel to the NS Railroad tracks.<br><br>Jennings Road Extension: A new roadway segment would be constructed south from the Quigley Avenue extension to Jennings Road to provide direct access between ISG property on the west side of the Cuyahoga River and the interstate highway network. | 6. Truck access between the interstate highway network and intermodal facilities along the Cuyahoga River must be fully integrated into the layout of the Central Interchange to minimize truck traffic movements along other sensitive infrastructure, such as the Huron Road bridges over the Tower City Center retail space, and through residential and commercial concentrations.<br><br>• The Eagle Avenue Viaduct, including the Eagle Avenue ramp, the West 3rd Street ramp and the Eagle Avenue Lift Bridge were closed to vehicular traffic in June 2003. Before any further environmental analysis is undertaken, the transportation models should be rerun with these segments removed to obtain a better assessment of the traffic impacts to all components of the Cuyahoga River Valley Consolidated Intermodal Connector. |
| **Central Viaduct Bridge over the Cuyahoga River Valley**<br>*Proposal:* Widen both eastbound and west bound from 4 lanes to 5 lanes for I-90 and a minimum inside shoulder along the center median and a full outside shoulder in each direction. | Opened in 1959, the Central Viaduct Bridge has been in continuous use throughout its 44-year history. Analysis of the substructure and superstructure indicate sufficient capacity to safely carry all legal and permitted loads with strength to spare and that the bridge piers, substructure and superstructure do not have to be replaced. Major deficiencies in the bridge deck have been identified consistent with other interstate bridges of similar age and construction in the region. Deck replacement is recommended in 2008.<br><br>The roadway configuration of the Central Viaduct Bridge has deficiencies relative to acceleration, deceleration and weave lengths that impact traffic operations causing congestion and safety evidenced by a crash rate 2.3 times higher than the regional average. | 1. Widen the existing bridge structure: Widen both eastbound and west bound from 4 lanes to 5 lanes for I-90 and a minimum inside shoulder along the center median and a full outside shoulder in each direction.<br>***– OR –***<br>2. Construct a new bridge on the existing alignment: Cross-section would include 5 lanes for I-90 in each direction and a minimum inside shoulder along the center median and a full outside shoulder in each direction.<br>***– OR –***<br>3. Construct a new bridge on a parallel alignment: Cross-sections would include 5 lanes for I-90 in each direction and a minimum inside shoulder along the center median and a full outside shoulder in each direction. | It is understood that this widening will occur within ODOT's existing right-of-way, but place traffic 12 feet closer to existing buildings. Given the close proximity of existing buildings to this right-of-way, the visual impacts and those related to noise, vibration and light from roadway fixtures located 12 feet closer to property lines must be fully identified and appropriate mitigating measures presented as part of the environmental analysis.<br><br>Currently people walk between the Tremont neighborhood and downtown using the emergency walkway along the Central Viaduct. Any widening or replacement of the Central Viaduct must accommodate pedestrian/bike paths linking downtown and the Tremont neighborhood.<br><br>Should construction of a new bridge on the existing or a parallel alignment be pursued, it shall have a signature design appropriate for a new landmark on the Cleveland skyline.<br><br>Should construction of a new bridge on a parallel alignment be pursued, the location of this new structure must be placed to waterfront development along the Cuyahoga River and must not preclude the future use of the CSX Railroad tracks serving the Dominion East Ohio Steam Plant by the Cuyahoga Valley Scenic Railroad. |

| COMPONENT | MAJOR FINDINGS | ODOT RECOMMENDATION | CITY STAFF COMMENTS |
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| **Central Interchange and I-77 Access between I-490 and I-90 east**<br>*Proposal:* Reconfigure the Central Interchange of I-90 and I-77 in the triangular area bounded by Broadway Avenue, East 22nd Street and Carnegie Avenue. | Three distinct transportation functions occur within the Central Interchange: (1) interstate-to-interstate movements between I-77 and I-90 (System Interchange traffic); (2) interstate-to/from-local roadway movements for I-77 and I-90 (Service Interchange traffic); and (3) local roadway traffic generated by the regional employment opportunities and destinations of downtown Cleveland and the Quadrangle.<br><br>The roadway configuration of the Central Interchange has deficiencies relative to acceleration, deceleration, storage and weave lengths that impact traffic operations causing congestion and safety evidenced by a crash rates 2.3 to 5.1 times higher than the regional average depending on specific locations within the Central Interchange. | 1. Central Viaduct/Central Interchange Modifications: The Central Viaduct would be widened to 5 lanes in each direction to configure both Ontario Street and East 9th Street ramps as add/drop lanes.<br>2. I-77 Access Modifications: Relocate all local movements to and from I-77 to a reconfigured Broadway/Orange avenues interchange eastward to occur east of East 22nd Street.<br>3. Central Interchange Modifications: Utilizing the existing alignment of I-90 for the Central Viaduct Bridge:<br>• Upgrade loop ramp design speed to 45 mph;<br>• Realign Community College Avenue and East 18th Street to form a new intersection;<br>• Realign Ontario Street around the new I-90 exit loop ramp to Ontario Street;<br>• Remove southbound I-77 entrance ramps from Ontario, East 9th, East 14th and East 21st streets;<br>• Remove northbound I-77 exits to Community College Avenue, East 18th Street and east 22nd Street;<br>• Remove the eastbound I-90 exit to Broadway Avenue;<br>• Remove the eastbound I-90 exit to East 22nd Street and Community College Avenue;<br>• Remove the westbound I-90 entrance from East 14th Street; and<br>• Connect Broadway Avenue and West 3rd Street for access to the East Bank of the Flats.<br>***– OR –***<br>Utilizing a new, parallel alignment south of the existing alignment of I-90 for the Central Viaduct Bridge:<br>• Realign Ontario Street and East 9th Street to better interface with the one-way configuration of Woodland and Orange avenues;<br>• Realign Community College Avenue and East 18th Street to form a new corridor;<br>• Provide access to I-90 at Ontario, East 9th and East 18th streets;<br>• Remove the southbound I-77 entrances from Ontario, East 9th, East 14th and East 21st streets;<br>• Remove the northbound I-77 exits to Community College Avenue, East 18th Street and East 22nd Street;<br>• Remove the eastbound I-90 exit to Broadway Avenue; Remove the eastbound I-90 exit to East 22nd Street and Community College Avenue;<br>• Remove the westbound I-90 entrance from East 14th Street; and<br>• Connect Broadway Avenue and West 3rd Street for access to the East Bank of the Flats.<br>4. I-77/East 30th Street Interchange Modifications:<br>• East 30th Street remains continuous between the eastbound and westbound roadways of a proposed Ontario/Woodland Boulevard; | The proposed realignment of the Central Interchange ramps and I-77 access appears to favor through traffic on the interstate highway network to a greater extent than local access between the interstate highway network and downtown and between the central business district and the institutions and businesses in the Quadrangle. It also will have a negative impact on the efforts of the Quadrangle for the past 20 years to establish this area as a cohesive, pedestrian-friendly institutional district. The character of any infrastructure modifications to the Central Interchange and I-77 through the Quadrangle must enhance the visual quality of this area and create a signature identity in terms of design of structures, including bridges and retaining walls, landscaping and infrastructure lighting.<br><br>Proposed modifications to ramp access for the interstate highway network will impact the traffic patterns for truck operations of the U.S. Post Office, which operates 24 hours-a-day, seven days-a-week. The traffic impacts of the modifications to the ramp access must be fully identified and mitigating measures presented.<br><br>It is not apparent what happens to Orange Avenue between East 22nd and East 30th streets with the interchange modifications proposed. This segment of roadway serves as the primary customer entrance to the Main Branch of the U.S. Post Office. Also, it is not apparent how the proposed modifications to the local street network will impact traffic patterns for truck operations and employee parking access for the Post Office, which operates 24 hours-a-day, seven days-a-week. The traffic impacts of the modifications to the local roadway network must be fully identified and mitigating measures presented.<br><br>Realignment of the Central Interchange and I-77 access should maximize redevelopment of any existing undeveloped property and any new parcels created with the new roadway layouts.<br><br>Truck access between the interstate highway network and intermodal facilities along the Cuyahoga River must be fully integrated into the layout of the Central interchange to minimize truck traffic movements along other sensitive infrastructure, such as the Huron Road bridges over the Tower City Center retail space, and through residential and commercial concentrations.<br><br>Reconstruction in the Central Interchange area must include relocation of the Greater Cleveland Regional Transit Authority's existing East 34th Street Rapid Transit Station to East 30th Street to enhance public transit usage in the Quadrangle.<br><br>Plans for the maintenance of access and traffic during construction in the Central Interchange area must respond to non-peak traffic movements to destinations in the Quadrangle and the southern area of downtown, particularly that traffic oriented to Cleveland State University, Cuyahoga Community College, St. Vincent's |

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| **Central Interchange and I-77 Access between I-490 and I-90 east (continued)** | | • Eastbound Ontario/Woodland Boulevard to southbound I-77 and westbound Ontario/Woodland Boulevard to northbound I-77 are continuous movements;<br>• Northbound I-77 with the Ontario/Woodland Boulevard, East 30th Street with westbound Ontario/Woodland Boulevard and East 30th Street with the eastbound Ontario/Woodland Boulevard are all signalized intersections; and<br>• East 22nd Street thru connections remain. | Charity Hospital and special events at the Gateway Sports Complex, the Theater District of Playhouse Square and various venues in the Quadrangle, including the CSU Convocation Center, Tri-C's Metro Campus theaters and Trinity Cathedral. |
| **Innerbelt Trench & Frontage Road System (Central Interchange to the Innerbelt Curve)**<br>*Proposal:* Consolidate freeway access points from seven partial interchanges to two for I-90 and provide frontage roads along the top of the Innerbelt Trench to provide local access. | The existing layout of the Innerbelt between the Central Interchange and the Innerbelt Curve has seven interchanges with 11 exit ramps and 12 entrance ramps in a two mile length of interstate. This places interchanges every ¼ mile rather than the preferred standard of one interchange every mile and provides a roadway configuration in the Innerbelt Trench with deficiencies relative to acceleration, deceleration and weave lengths that impact traffic operations causing congestion and safety evidenced by a crash rates 2.0 to 3.7 times higher than the regional average depending on specific locations within the Innerbelt Trench Area.<br><br>The number of interchanges and the confusion created from their orientation reduces their operational efficiency and makes them less appealing as choices for drivers, especially those not familiar with the area. | 1. Trench Configuration: I-90 would remain in the existing trench between the Central Interchange and the Innerbelt Curve and have three lanes with a minimum inside shoulder along a center median and a full outside shoulder in each direction.<br>2. Frontage Road System: Between Chester Avenue and St. Clair Avenue frontage roads would be constructed on each side of the Innerbelt Trench to consolidate direct access to the freeway while maintaining all cross-streets (Carnegie Avenue, Prospect Avenue, Euclid Avenue, Chester Avenue, Payne Avenue, Superior Avenue, St. Clair Avenue, Hamilton Avenue and Lakeside Avenue)within the area of the frontage road system.<br>3. Interstate Access Ramps: Access between I-90 and the local street network, including the frontage roads, would occur at Chester Avenue and St. Clair Avenue.<br><br>Existing access ramps would be removed at East 22nd Street, Carnegie Avenue, Prospect Avenue, Superior Avenue and Lakeside Avenue.<br><br>The potential for freeway caps could occur between East 22nd Street and Euclid Avenue, between Chester and Payne avenues, and between Payne and Superior avenues. | Today, the Innerbelt acts as a local street between the Innerbelt Curve and Prospect Avenue for many drivers traveling between the north side of downtown, the Midtown Corridor and the Quadrangle. The streets associated with the frontage road network must be extended south, at least to Prospect Avenue and possibly to East 22nd Street to maintain this north-south access between East 21st/East 22nd streets and East 30th Street.<br><br>A typical cross-section for roadway improvements associated with the frontage road network, including sidewalks, bicycle facilities and landscaping should be identified. The character of any infrastructure modifications to the Innerbelt Trench and the Frontage Roads through the Quadrangle must enhance the visual quality of this area and create a signature gateway identity in terms of design of structures, including bridges and retaining walls, landscaping and infrastructure lighting. |
| **Innerbelt Curve Improvements between Lakeside Avenue and East 40th Street**<br>*Proposal:* Flatten the I-90 Curve between the CSX Railroad tracks and East 40th Street and downgrade Memorial Shoreway (SR-2) west of the Innerbelt Curve to the Main Avenue Bridge to a roadway or parkway. This would change the interchange between I-90 and SR-2 from a System Interchange to a Service Interchange. | The safety and operational impacts of the existing design of the Innerbelt Curve and the associated interchange of I-90 and SR-2 are severe. The Innerbelt Curve's radius is less than required by current design standards with a design speed of approximately 35 mph that seriously hampers traffic flow and capacity. In the westbound direction on I-90 the four-lane mainline freeway narrows to two lanes in the Innerbelt Curve. Over the years, warning signs, rumble strips, and higher superelevation have been constructed to reduce the crash rate and severity along the Curve. The poor geometry and spacing associated with the Lakeside and St. Clair ramps further exacerbate these problems.<br><br>The crash rate along this section of I-90 is slightly less than the regional average. However, crashes involving the drivers' inability to control the vehicle (failure to control) account for 32.5 percent of all crashes. In addition, there were a total of nine crashes in a three-year period that | 1. Flatten the Innerbelt Curve: Relocate the I-90 mainline to increase the radius of this curve.<br>2. Interstate Access Ramps: Existing access ramps for I-90 at Lakeside Avenue and East 38th Street would be removed.<br><br>Reconfigure the interchange between I-90 and SR-2 either to maintain a System Interchange between the Innerbelt and the Shoreway or a Service Interchange with the proposed Lakefront Boulevard/Parkway.<br>3. Lakeside Industrial Area Access: Construct a local street segment of I-90 at East 40th Street to provide access to the Lakeside Industrial Area from North and South Marginal roads. | The Lakeside Industry area on both sides of the Innerbelt is an employment center with a concentration of distribution facilities that arose because of the ease of interstate access provided by the Lakeside Avenue ramps for I-90. In order to maintain this area as an employment center, it is essential that similar direct access to this area south of the railroad tracks on both sides of I-90 be maintained during construction and as part of permanent improvements.<br><br>In accordance with the goals and objectives adopted for the "Lakefront Study", the Lakefront Boulevard must be designed as a continuous pedestrian- and bicycle-friendly roadway ultimately extending from the existing Lake Avenue/West Shoreway intersection on Cleveland's west side to Lakeshore Boulevard at the Cleveland/Bratenahl corporate limit, and should be designed and presented as such through the I-90 interchange at the Innerbelt Curve. |

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| **Innerbelt Curve Improvements between Lakeside Avenue and East 40th Street (continued)** | involved vehicles overturning. These types of crashes are considered particularly severe. The elevated crash rate is attributed primarily to the drivers' inability to safely adjust their travel speed in response to the daily recurring congestion that results from the numerous closely spaced ramps and the inability of drivers to safely negotiate the severe geometry of the Innerbelt Curve. | | The Lakefront Boulevard cross-section must be extended to East 55th Street, which serves as a terminus for North Marginal Road.<br><br>A typical cross-section for roadway improvements associated with the Lakefront Boulevard, including sidewalks, bicycle facilities and landscaping should be identified.<br><br>The character of any infrastructure modifications associated with the Innerbelt Curve must enhance the visual quality of this area and create a signature gateway identity in terms of design of structures, including bridges and retaining walls, landscaping and infrastructure lighting.<br><br>Infrastructure modifications associated with the Innerbelt Curve must not preclude extension of the GCRTA Waterfront Line east to Cleveland's Collinwood neighborhood.<br><br>Plans for the maintenance of access and traffic during construction in the Innerbelt Curve area must respond to non-peak traffic movements to destinations along the Lakefront and in downtown Cleveland. |
| **Priority Corridors**<br>*Proposal:* Establish key streets within and extending from downtown Cleveland as Priority Corridors to better direct and manage the flow of traffic between the local street grid and the interstate highway network. | Approximately 85 percent of the traffic using the Innerbelt has a destination within the study area during the AM peak period or an origin within the study area during the PM peak period. However, Downtown Cleveland has no clear street system hierarchy in place that moves traffic from minor streets to major arterial streets to the interstates.<br><br>If any of the modifications that consolidate access to the interstate highway network (I-71, I-77, I-90 and I-490) served by the Innerbelt are implemented, the importance of having a hierarchy of streets becomes important to maintain traffic flows between major destinations and the interstates. | Establish the following streets as Priority Corridors providing direct access between destinations in the Innerbelt Study area and the interstate highway network. Arterial signal coordination should reflect this hierarchy and key intersections along these corridors should be improved to complement changes to the interstate highway network. Streets proposed to be Priority Corridors include:<br><br>• Ontario/Woodland Corridor (Public Square to East 55th Street)<br>• Superior Corridor (Veteran Memorial Bridge to East 55th Street)<br>• Lakefront Boulevard/Parkway Corridor (Cuyahoga River to the Innerbelt Curve)<br>• East 9th Street (Ontario/Woodland Corridor to Lakefront Boulevard/Parkway Corridor)<br>• East 18th Street (Ontario/Woodland Corridor to Lakefront Boulevard/Parkway Corridor)<br>• Carnegie Avenue (Ontario Street to East 30th Street)<br>• Innerbelt Frontage Road Corridor (Chester Avenue to St. Clair Avenue)<br>• Chester Avenue Corridor (East 9th Street to East 30th Street) | For each street identified as a priority corridor, termini and a typical cross-section for roadway improvements should be identified.<br><br>A comprehensive wayfinding signage should be integrated into improvements associated with the Priority Corridors. |
| **CSX Railroad Bridge (East 55th St.)**<br>*Proposal:* Widen the roadway right-of-way under the CSX Railroad tracks to accommodate two traffic lanes in each direction. | East 55th Street north and south of the CSX Railroad bridge is four lanes, but only two lanes through the underpass. Improving this pinch point is needed to facilitate traffic movements using the East 55th Street/I-90 interchange. | Widen the roadway right-of-way under the CSX Railroad tracks to accommodate two traffic lanes in each direction. | Any widening of this underpass must incorporate sidewalks on both sides of the street and a bike path for neighborhood access between the St. Clair-Superior neighborhood and the Lakefront. |

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| **University Circle Access Boulevard East 55th Street st the I-490 ramps to East 105th Street and Carnegie Avenue)**<br>*Proposal:* To construct controlled access roadway for direct arterial street access between the East 55th Street/I-490 interchange and University Circle along the existing railroad lines. | • Operational modeling shows that the proposed construction of the University Circle Access Boulevard has a positive impact.<br>• Cut-through traffic along West 14th Street through Tremont is notably reduced with the inclusion of the University Circle Access Boulevard.<br>• Traffic is reduced at three of the four primary bottlenecks within the Innerbelt Study area.<br>• Right-of-way takes are likely to be significant. | Construct a new urban boulevard with a landscaped median, three traffic lanes in each direction, and sidewalks on both sides of the proposed right-of-way between East 55th Street and the East 105th Street/Carnegie Avenue intersection. Alignments are possible on both sides of the existing railroad trench. Potential intersections at major cross-town streets for the new boulevard may include:<br>• East 55th Street<br>• Kinsman Avenue<br>• East 75th Street<br>• East 79th Street<br>• Buckeye Avenue<br>• Woodland Avenue<br>• East 89th Street<br>• East 93rd Street<br>• Quincy Avenue<br>• East 105th Street | Termini and a typical cross-section for roadway improvements associated with the University Circle Access Boulevard should be identified. This right-of-way configuration should be designed as a pedestrian-friendly environment and integrate bikeway facilities.<br><br>The character of any infrastructure modifications associated with the University Circle Access Boulevard must enhance the visual quality of this area and create a signature gateway identity in terms of design of structures, including bridges and retaining walls, landscaping and infrastructure lighting.<br><br>Additional attention should be given to how roadway improvements to East 105th Street and Carnegie Avenue could be extended to redirect a higher degree of commuter traffic from the Heights via Cedar Road hill and the University Circle Access Boulevard and away from Chester and Carnegie avenues for interstate access.<br><br>The GCRTA's Red Line stations at East 55th Street, East 79th Street and East 105th Street/Quincy Avenue must be fully integrated into the design of these cross streets with the University Circle Access Boulevard to facilitate transit usage and promote transit-oriented development. New stations should be considered in the vicinity of the Buckeye/Woodland intersection and Kinsman Avenue. |
| **Public Transit Improvements**<br>*Proposal:*<br>1. Expansion of existing Park-n-Ride lots<br>2. Increase express bus service | According to a NOACA usage survey, the existing Westlake Park-n-Ride lot is filled nearly to capacity on a daily basis. The Strongsville Park-n-Ride lot is located in southern Cuyahoga County in an area experiencing residential growth and is well suited to downtown Cleveland commuters in the I-71 travel corridor.<br><br>Service improvements are proposed for the I-71 corridor and I-90 west of the Cuyahoga River to increase the availability of express bus service during weekday peak periods in peak directions. | 1. Westlake Park-n-Ride lot: Expand the existing 562-space lot off I-90 between Columbia and Clague roads to accommodate 200 more cars or construct a new lot in this area.<br>2. Strongsville Park-n-Ride lot: Expand the existing 388-space lot off I-71 by the Ohio Turnpike exit to accommodate 150 more cars.<br>3. Increase Express Bus Service: Increased service is proposed for the following routes:<br>• 51F Strongsville (peak)<br>• 251 Strongsville (peak)<br>• 55CX Westlake (mid-day)<br>• 246 Westlake (peak)<br>• 22 Linndale (peak)<br>• 86F Berea (peak)<br>• 79/79X Parma (peak)<br>• 51X Middleburg Heights (peak)<br>• 35F/135 Pleasant Valley (peak) | Low cost improvements to extend existing interstate marginal roads were not evaluated for RTA's Triskett and East 150th/Puritas Rapid Transit Stations. Short street extensions could provide more direct access between the interstates and these stations increasing public transit ridership during construction and after.<br><br>Increases in peak period bus service will add to traffic congestion in downtown Cleveland as buses stage for afternoon rush service. Staging plans for downtown streets must be developed or RTA Transit Centers pursued as a construction mitigation measure. |

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| **Intelligent Transportation Systems (ITS)**<br>*Proposal:*<br>1. Freeway Management System<br>2. Arterial Management System<br>3. Maintenance of Access/Maintenance of Traffic (MOA/MOT) Management System | To enhance traffic flows on the interstate highway network and local streets, ITS focuses attention on:<br>• Incident detection<br>• Verification/traffic monitoring and surveillance<br>• Traveler information<br>• Weather detection and information<br>• Traffic data management<br>• Maintenance and construction management<br>• Arterial signal optimization | Dispersed Transportation Management Centers would be established to coordinate ITS functions including:<br>• Automatic traffic recorders (vehicle speeds and volumes)<br>• Highway advisory radio<br>• Portable dynamic message signs for detours and upcoming construction and hazards<br>• ODOT's CrewZers, a freeway patrol service that detects and assists in clearance of incidents<br>• Road weather information system units to detect weather conditions<br>• Reference markers at reduced spacing<br>• Metro Networks for real time traffic information to local radio affiliates, television affiliates and paid subscribers via cell phones and pagers | Plans for the maintenance of access and traffic during construction in the Innerbelt Study area must respond to non-peak traffic movements to destinations along the Lakefront and in downtown Cleveland. |